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UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 26, 1980

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

GENERAL INFORMATION concerning TRADEMARKS, price $1.50 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Jan. 28, 1980.

Board of Appeals Decisions Rendered in the Month of January 1980

Affirmed	176
Affirmed in part	26
Reversed	71
Total	273

Classification Definitions in Microfiche

The Patent and Trademark Office announces the availability of *Classification Definitions* in microfiche form, offered for sale on a subscription basis through the Superintendent of Documents, U.S. Government Printing Office.

A subscription consists of an initial set of microfiche containing all of the definitions and subsequent quarterly issues of microfiche providing any newly published definitions or any changes in existing definitions. The term of a subscription will depend upon the number of quarterly update microfiche issued, but is expected to extend for two years.

Each of the definitions is published in its entirety on one or two microfiche, including all addenda. The microfiche are sheets of diazo type film of 105mm by 148mm (4'' x 6''), which contain up to 98 pages of information at a reduction ratio of 24:1. The present full set consists of 323 definitions on 359 microfiche, containing definitions for over 100,000 subclasses.

For the convenience of the user, changes resulting from addenda will be hand-entered into the text where feasible; all other changes will be indicated by reference in the text to addendum page number. Where a class definition is modified in any way through an addendum or republication, the entire microfiche(s) for that definition will be replaced in the next issuing update.

Paper copies of individual class definitions will continue to be available from U.S. Patent and Trademark Office, Office of Documentation Planning, Support and Control, Special Processing Section, Room 7D30, CP2, Washington, D.C. 20231 [telephone (703) 557-9361]. Prices vary according to the size of each document.

The *Classification Definitions* in microfiche may be purchased only from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The price for domestic orders (United States and possessions only) is $170. All other orders are priced at $212.50. Payment may be made by check or money order, by charge to your Superintendent of Documents deposit account or by charge to your Master Charge or Visa card. Orders may also be made by telephone at any GPO bookstore or by calling the Washington order desk (from 8:00 A.M.–4:30 P.M. eastern time, weekdays except holidays) at (202) 783-3238.

ALFRED C. MARMOR,
Administrator for Documentation.

Jan. 16, 1980

Establishment and Membership of Performance Review Board

This notice announces the establishment, by the Commissioner of the Patent and Trademark Office (PTO), as Appointing Authority for the Senior Executive Service at PTO, of the Performance Review Board (PRB) and the appointment of its members.

The purpose of the PRB is to review (1) initial appraisals and ratings prepared by supervisors of senior executives, (2) the responses of senior executives, (3) the written review of initial ratings by higher level management when made, as well as providing written reports on senior executive appraisals and ratings to the Commissioner. The PRB may also make recommendations to the Commissioner on matters that will ensure the fair and equitable treatment of senior executives and instill, in the minds of all concerned, confidence regarding the integrity, competence, and impartiality of the PRB. The PRB will perform its review functions for all PTO members of the Senior Executive Service.

The names, titles, and terms of service of the PRB members who have been appointed are set forth below:

Lutrelle F. Parker, *Chairman,* Deputy Commissioner, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent.

Rene D. Tegtmeyer, *Member,* Assistant Commissioner of Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent.

Richard J. Shakman, *Member,* Assistant Commissioner for Administration, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent.

James O. Thomas, Jr., *Member,* Director, Patent Examining Group 140, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—3 years.

Herbert C. Wamsley, *Member,* Executive Assistant to the Commissioner, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—3 years.

William Feldman, *Member,* Deputy Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—2 years.

Jere W. Sears, *Member,* Deputy Solicitor, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—2 years.

Richard P. Bartlett, Jr., (*Outside*) *Member,* Director of Administrative and Information Systems, National Bureau of Standards, Washington, D.C. 20234. Term—1 year.

The Personnel Officer, Aaron W. Deitch, shall serve as Executive Secretary to the PRB. Anyone desiring further information about the PRB or its membership should contact the Personnel Officer, Office of Personnel, U.S. Patent and Trademark Office, Washington, D.C. 20231. Telephone (703) 557-2662.

RENE D. TEGTMEYER,
Acting Commissioner of Patents and Trademarks.

Dated: Jan. 31, 1980.

Conference on Patents at Purdue University

The Patent and Trademark Office, in conjunction with the Greater Lafayette Chamber of Commerce, the Indiana State Chamber of Commerce, the Indianapolis Center for Advanced Research, Inc., and the International Trade Administration of the Department of Commerce, is sponsoring a conference on patents to be held at Purdue University on March 14, 1980. The conference, "What You Need to Know About Patents," will begin with a luncheon highlighted by an address by Senator Birch Bayh. The program will be moderated by the Commissioner of Patents and Trademarks, Sidney A. Diamond. Other speakers will include Donald W. Banner, former Commissioner of Patents and Trademarks, Dr. Robert Henderson, President, Indianapolis Center for Advanced Research, Inc. and Lyman H. Wolfla, II, President, Lyman H. Wolfla, Inc., Indianapolis, Indiana. This conference will be of value not only to patent attorneys and patent

agents, but also to inventors, engineers, researchers, small businessmen, and anyone else interested in learning more about patents.

Registration for this conference will be at 11:30 a.m., March 14, 1980, West Faculty Lounge, Purdue Memorial Union, Purdue University. For more information, or for advance registration, write or call Becky Jane Smith, 126 Stewart Center, Purdue University, West Lafayette, Indiana 47907, telephone (317) 749-2533, or Mr. Mel Sherar, International Trade Administration, Department of Commerce, 46 E. Ohio Street, Indianapolis, Indiana 46204, telephone (317) 269-6214.

LUTRELLE F. PARKER,
Dated: Feb. 5, 1980. *Acting Commissioner of Patents and Trademarks.*

Availability of Consolidated Listing

The "Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures," which appeared in the OFFICIAL GAZETTE of January 1, 1980, is available, as a separate publication, from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Please include the following information when ordering. Stock. No. 003-004-00567-0, cost $4.50.

RICHARD J. SHAKMAN,
Dated: Feb. 5, 1980. *Assistant Commissioner for Administration.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,062,367, Re. S.N. 096,610, Filed Nov. 21, 1979, Cl. 131/134, TIERED CONTAINER WITH FLOW DISTRIBUTION SYSTEM, Robert C. Johnson, Owner of Record: *Reynolds Leasing Corporation, Jacksonville, Fla.,* Attorney or Agent: Grover M. Myers, et al., Ex. Gp.: 335

4,064,254, Re. S.N. 098,008, Filed Nov. 28, 1979, Cl. 424/267, SUBSTITUTED PIPERIDINES THERAPEUTIC PROCESS AND COMPOSITIONS, Stanley J. Dykstra, et al., Owner of Record: *Mead Johnson & Co., Evansville, Ind.,* Attorney or Agent: Robert E. Carnahan, et al., Ex. Gp.: 125

4,143,187, Re. S.N. 097,234, Filed Nov. 26, 1979, Cl. 427/358, PROCESS FOR COATING SHEET SUBSTRATES WITH THERMOPLASTIC POLYMER, James Frank Pilgrim, et al., Owner of Record: *Du Pont of Canada Limited, Montreal, Canada,* Attorney or Agent: Ivan G. Szanto, Ex. Gp.: 162

PATENT NOTICES

Certificates of Correction for the Week of Feb. 26, 1980

Plt. 4,465	4,098,740	4,129,725	4,164,379
Re. 29,829	4,098,815	4,129,726	4,166,534
Re. 29,891	4,098,898	4,130,580	4,166,770
Re. 29,948	4,098,980	4,132,153	4,168,104
Re. 29,964	4,099,658	4,132,741	4,168,346
Re. 30,014	4,101,513	4,133,012	4,168,924
D. 246,311	4,104,889	4,133,325	4,168,929
3,581,542	4,105,566	4,134,022	4,169,186
3,902,668	4,105,622	4,136,879	4,169,463
3,922,319	4,107,203	4,137,825	4,169,827
3,926,839	4,107,887	4,139,490	4,170,167
3,946,358	4,112,014	4,139,720	4,170,189
3,957,739	4,112,015	4,140,180	4,170,305
3,984,347	4,113,664	4,140,527	4,170,663
3,989,908	4,114,042	4,142,968	4,170,917
3,993,570	4,116,927	4,143,059	4,171,213
3,996,194	4,120,350	4,143,172	4,171,237
3,996,264	4,122,460	4,143,760	4,171,389
4,034,990	4,123,424	4,144,935	4,171,647
4,035,198	4,123,766	4,145,442	4,171,667
4,046,923	4,124,356	4,147,670	4,172,250
4,053,058	4,124,382	4,148,211	4,172,857
4,054,420	4,124,483	4,148,342	4,172,922
4,056,487	4,124,872	4,148,949	4,173,079
4,057,820	4,125,951	4,148,968	4,173,155
4,061,625	4,126,605	4,150,028	4,173,556
4,070,061	4,126,640	4,150,531	4,174,210
4,072,435	4,127,045	4,154,676	4,174,406
4,072,653	4,127,066	4,154,702	4,174,439
4,073,873	4,127,168	4,155,095	4,174,482
4,082,435	4,127,301	4,155,123	4,174,702
4,083,630	4,127,679	4,156,578	4,174,984
4,085,270	4,127,720	4,158,331	4,175,088
4,086,257	4,128,070	4,158,347	4,175,149
4,088,685	4,128,086	4,159,273	4,175,150
4,091,300	4,128,127	4,160,213	4,175,486
4,094,903	4,128,269	4,162,820	4,175,663
4,095,464	4,128,397	4,162,932	4,177,010
4,097,845	4,128,425	4,162,941	4,177,639
4,097,873	4,129,559	4,163,697	4,180,465
4,098,319			

Dedication

4,141,929.—*Reginald B. Stoops,* Gainesville, Fla., and *John M. Mazel,* St. Charles, Ill. UNIDIRECTIONAL SHEET MOLDING COMPOSITION AND PROCESS OF PREPARING SAME. Patent dated Feb. 27, 1979. Dedication filed Dec. 5, 1979, by the assignee, Armco, Inc.

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers

3,481,783.—*Hans-Jurgen Von Der Linde, Wolfenbuttel,* and *Wilhelm Haberich,* Braunschweig, Germany. MOLASSES PURIFICATION. Patent dated Dec. 2, 1969. Disclaimed filed Dec. 13, 1979, by the assignee, Braunschweigische Maschinenbauanstalt.

Hereby enters this disclaimer to claim 1 of said patent.

3,723,474.—*Eugene G. Teach,* El Cerrito, and *Duane R. Arneklev,* Sunnyvale, Calif. META-THIOCARBAMYL PHENYLENE AMIDES AND UREAS AND THEIR UTILITY AS HERBICIDES. Patent dated Mar. 27, 1973. Disclaimer filed Jan. 10, 1980, by the assignee, Stauffer Chemical Company.

Hereby enters this disclaimer to claims 14 to 30, inclusive of said patent.

4,161,407.—*Gerald Allan Campbell,* Webster, N.Y. CROSS-LINKABLE POLYMERS HAVING VINYLSULFONYL GROUPS OR STYRYLSULFONYL GROUPS AND THEIR USE AS HARDENERS FOR GELATIN. Patent dated July 17, 1979. Disclaimer filed Dec. 20, 1979, by the assignee, Eastman Kodak Company.

Hereby enters this disclaimer to all claims of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va., 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division
Room 2D 444
Pentagon, Washington, D.C. 20310

Patent application 6-004,625. Chemiluminescent Method and Apparatus for the Detection of Ozone. Filed Jan. 19, 1979.

Patent application 6-019,193. Microwave Oscillator for Microwave Integrated Circuits Applications. Filed Mar. 9, 1979.

Patent application 6-019,688. Resonant Subcavity Differential Spectrophone. Filed Mar. 12, 1979.

Patent application 6-019,791. Keeper for Load Carrying Equipment. Filed Mar. 12, 1979.

Patent application 6-028,934. Wideband Antenna With Frequency Dependent Ferrite Core Inductor. Filed Apr. 11, 1979.

Patent application 6-029,182. Multiple Access, Time-Division Multiplex, Satellite Communications System. Filed Apr. 12, 1979.

Patent application 6-030,966. Piezoelectric Polymer Heat Exchanger. Filed Apr. 17, 1979.

Patent application 6-033,911. Permanent Magnet Materials. Filed Apr. 27, 1979.

Patent application 6-033,939. Magnetic Alloys. Filed Apr. 27, 1979.

Patent application 6-033,940. Method of Treating a Permanent Magnet Alloy. Filed Apr. 27, 1979.

Patent application 6-036,199. Double Button Spurious Signals Prevention Circuit. Filed May 4, 1979.

Patent application 6-037,256. Tube With Bonded Cathode and Electrode Structure and Getter. Filed May 9, 1979.

Patent application 6–037,257. Bonded Cathode and Electrode Structure With Layered Insulation and Method of Manufacture. Filed May 9, 1979.

Patent application 6–040,366. Method of Making a Quartz Resonator. Filed May 18, 1979.

Patent application 6–040,376. Method and Apparatus for Manufacturing Masked Motion Picture Film for Simulated Target Practice. Filed May 18, 1979.

Patent application 6–042,654. Fast Warm-Up Oven Controlled Oscillator. Filed May 25, 1979.

Patent application 883,552. Re-Entrant Insulator Design for Geiger-Mueller Tube of the Like. Filed Mar. 6, 1978.

Patent application 958,595. Connector for Splicing Optical Fibers. Filed Nov. 7, 1978.

Patent application 959,264. Method of Extending the Storage Life in the Frozen State of Precooked Foods. Filed No. 9, 1978.

Patent application 959,265. Dental Liquid Entrees and Method of Making. Filed Nov. 9, 1978.

Patent application 970,017. Interference Cancelling System. Filed Dec. 18, 1978.

Patent application 970,608. Self-Adaptive Mobile Subscriber Access System Employing Time Division Multiple Accessing. Filed Dec. 18, 1978.

Patent application 972,199. Variable Resistance Attenuator. Filed Dec. 22, 1978.

Patent application 972,532. Automatic Channel Selection. Filed Dec. 22, 1978.

Patent application 973,402. Electronic Intruder Detection System. Filed Dec. 26, 1978.

Patent application 973,642. Radar Antenna. Filed Dec. 26, 1978.

Patent 4,118,211. Method of Maintaining the Strength of Optical Fibers. Filed June 22, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,857. Flipped Method for Characterization of Epitaxial Layers. Filed Jan. 12, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,119,462. Color Photographic Developer Composition. Filed May 24, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,120,547. Dissecting Tray. Filed Nov. 23, 1976. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,120,701. Reactant for Steel. Filed Aug. 25, 1966. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,121,666. Fuel (Flammable Liquid) Tank Fire Extinguisher. Filed Apr. 11, 1977. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,124,066. Radiator Shutter for Arctic Vehicles. Filed Jan. 3, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,124,280. Acoustic-Optic Technique for Processing Many Signals Simultaneously. Filed June 7, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,125,376. Method for Detecting Water Pollutants. Filed Apr. 22, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,126,039. Projectile Strain Damage Indicating Device. Filed May 26, 1977. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,126,736. Anionically Polymerized Copolymers of Methyl Alpha-N-Alkylacrylate and Methyl Methacrylate and Method of Making Same. Filed Apr. 3, 1978. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,129,459. Method for Diminishing the Strength and Ductility of Steel Utilizing a Lithium-Indium-Amalgam Containing a Small Amount of Vanadium Pentoxide. Filed Aug. 25, 1966. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,129,893. Thermoelectric Generator Overload Protective Device Using Hysterisis Control. Filed May 31, 1977. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,132,271. Fragment Prevention Screen for Explodable Fire Suppressant Panels. Filed July 11, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,134,100. Fluidic Mud Pulse Data Transmission Apparatus. Filed Nov. 30, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,134,367. Electronic Fuel Injection Control. Filed May 26, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,134,681. Method of Determining Relative Orientation of Physical Systems. Filed Aug. 5, 1976. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,159. Apparatus for Suppressing a Strong Electrical Signal. Filed June 24, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,137,651. Moving Target Practice Firing Simulator. Filed May 19, 1978. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,137,761. Tilting Table Initial Tack Test Apparatus for Adhesive Bonds. Filed Oct. 11, 1977. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,138,196. Fiber Interferometer Rotary Motion Sensor. Filed July 6, 1977. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,138,512. Process for Chemical Vapor Deposition of a Homogeneous Alloy of Refractory Metals. Filed Oct. 17, 1977. Patented Feb. 5, 1979. Not available NTIS.

Patent 4,138,684. Loaded Microstrip Antenna With Integral Transformer. Filed May 12, 1977. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,139,908. Photovoltaic-Ferroelectric Data Recorder. Filed Aug. 15, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,140,062. Differential Integrator. Filed Feb. 16, 1955. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,710. Recovery of o-Chlorobenzilidene Malononitrile From Finely Divided Mixtures Thereof With Colloidal Silica. Filed Aug. 1, 1978. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,917. East Risetime Spiral Pulse Generator. Filed July 20, 1977. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,141,801. Fuel Cell Anode Electrode, Method of Making the Fuel Cell Anode Electrode, and Fuel Cell Containing the Fuel Cell Anode Electrode. Filed Dec. 15, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,190. Microstrip Feed With Reduced Aperture Blockage. Filed Sept. 29, 1977. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,859. Chemiluminescent Process and Detector for Monitoring Atmospheric Contaminants. Filed June 23, 1977. Patented Mar. 6, 1979. Not available NTIS.

Patent 4,143,971. Reconnaissance/Surveillance System Utilizing Color Signature of Target. Filed Aug. 22, 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,144,591. Memory Transistor. Filed Apr. 5, 1978. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,146,394. Filter Pack Correction Method in Color Photography. Filed Mar. 4, 1975. Patented Mar. 27, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administration Service Division Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent 4,167,250. Sequential Velocity Disk Refiner. Filed Apr. 19, 1978. Patented Sept. 11, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel For Patents,
Room A 2–3018
Washington, D.C. 20545

Patent 4,099,852. Lens Positioner With Five Degrees of Freedom. Filed Oct. 5, 1976. Patented July 11, 1978. Not available NTIS.

Patent 4,102,739. Method of Shielding a Liquid-Metal-Cooled Reactor. Filed Sept. 30, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,148. Dynamic Pulse Difference Circuit. Filed Nov. 24, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,165. Neutron Responsive Self-Powered Radiation Detector. Filed Mar. 23, 1977. Patented July 25, 1978. Not available NTIS.

Patent 4,103,555. Pressure Sensor for High-Temperature Liquids. Filed June 6, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,105,470. Dye-Sensitized Schottky Barrier Solar Cells. Filed June 1, 1977. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,107,519. Optical Control System for High-Voltage Terminals. Filed Apr. 13, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,109,612. Electroless Plating Apparatus for Discrete Microsized Particles. Filed Sept. 16, 1975. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,049. Sun Meter. Filed Mar. 8, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,517. Electrochemical Cell Design. Filed Jan. 11, 1978. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,111,747. Packed Rod Neutron Shield for Fast Nuclear Reactors. Filed June 8, 1976. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,113,562. Apparatus for Controlling Coolant Level in a Liquid-Metal-Cooled Nuclear Reactor. Filed Apr. 20, 1977. Patented Sept. 12, 1978. Not available NTIS.

Patent 4,113,564. Core Disruptive Accident Margin Seal. Filed Aug. 13, 1976. Patented Sept. 12, 1978. Not available NTIS.

Patent 4,115,193. Nuclear Reactor Pressure Vessel Support System. Filed Aug. 17, 1976. Patented Sept. 19, 1978. Not available NTIS.

Patent 4,116,764. Apparatus for Controlling Nuclear Core Debris. Filed Feb. 11, 1976. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,116,766. Ultrasonic Dip Seal Maintenance System. Filed Aug. 31, 1976. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,118,249. Modular Assembly of a Photovoltaic Solar Energy Receiver. Filed Aug. 30, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,275. Variable Flow Control for a Nuclear Reactor Control Rod. Filed Dec. 12, 1974. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,278. Nuclear Reactor Insulation and Preheat System. Filed Sept. 27, 1976. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,127,443. Compact Power Reactor. Filed May 4, 1960. Patented Nov. 28, 1978. Not available NTIS.

Patent 4,130,107. Solar Concentrator With Restricted Exit Angles. Filed Nov. 10, 1977. Patented Dec. 19, 1978. Not available NTIS.

Patent 4,133,854. Method for Producing Small Hollow Spheres. Filed June 16, 1977. Patented Jan. 9, 1979. Not available NTIS.

Patent 4,134,960. Method for Dissolving Plutonium Oxide With HI and Separating Plutonium. Filed June 1, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,973. Core Disruptive Accident Margin Seal. Filed Mar. 10, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,136,282. Directional Detector of Gamma Rays. Filed Nov. 29, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,140,576. Apparatus for Neutralization of Accelerated Ions. Filed Sept. 22, 1976. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,142,088. Method of Mounting a Fuel Pallet in a Laser-Excited Fusion Reactor. Filed Jan. 27, 1976. Patented Feb. 27, 1979. Not available NTIS.

Patent 4,142,300. Lanthanum Nickel Aluminum Alloy. Filed July 18, 1977. Patented Mar. 6, 1979. Not available NTIS.

Patent 4,143,316. Hydrogen Consentration Meter Utilizing a Diffusion Tube Composed of 2¼ Cr–1 Mo Steel and a Sleeve of Nickel. Filed Sept. 7, 1977. Patented Mar. 6, 1979. Not available NTIS.

Patent 4,144,059. Ductile Long Range Ordered Alloys With High Critical Ordering Temperature and Wrought Articles Fabricated Therefrom. Filed Mar. 14, 1978. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,144,454. Tape Transport Mechanism. Filed Jan. 27, 1977. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,146,449. Purification of Silane Via Laser-Induced Chemistry. Filed Dec. 28, 1977. Patented Mar. 27, 1979. Not available NTIS.

U.S. ENVIRONMENTAL PROTECTION AGENCY
Room W513, 401 M St. SW.
Washington, D.C. 20460

Patent application 6–015,314. Two Stage Catalytic Combustion Process and Apparatus. Filed Feb. 26, 1979.

Patent application 799,948. Catalytic Combustion Process and Apparatus. Filed May 24, 1977.

Patent application 893,575. Catalytic Combustion Process and System. Filed Apr. 5, 1978.

Patent application 911,549. Conversion of Sulfur-Containing Fuel to Sulfur-Free Gases. Filed June 1, 1978.

Patent application 920,944. Remote Controlled Air Sampler. Filed June 30, 1978.

Patent 4,035,170. Granular Filter. Filed Jan. 8, 1976. Patented July 12, 1977. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–040,921. Detection of Non-A, Non-B Hepatitis Associated Antigen. Filed May 21, 1979.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

Patent 4,159,641. Vibrating Wire Stress Meter. Filed Sept. 3, 1974. Patented July 3, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–4, Washington, D.C. 20546

Patent application 6–053,569. Containerless High Temperature Calorimeter Apparatus. Filed June 29, 1979.

Patent application 6–043,941. Copper Doped Polycrystalline Silicon. Filed May 30, 1979.

Patent application 6–043,944. Superplastically Formed Diffusion Bonded Metallic Structure. Filed May 30, 1979.

Patent application 6–044,428. Method for Anisotropically Etching a Silicon Wafer Having a Reinforced Peripheral Portion. Filed June 1, 1979.

Patent application 6–044,429. General Logic Structure for Custom LSI Circuits. Filed June 1, 1979.

Patent application 6–044,431. Improved Power Factor Control System for AC Induction Motors. Filed June 1, 1979.

Patent application 6–044,432. Multifunctional Transducer. Filed June 1, 1979.

Patent application 712,270. Apparatus and Method of Inserting a Microelectrode in Body Tissue or the Like Using Vibration Means. Filed Sept. 6, 1976.

Patent application 837,513. Schottky Barrier Cell and Method of Fabricating It. Filed Sept. 29, 1977.

Patent application 899,828. A High-Speed Data Link for Moderate Distances and Noisy Environments. Filed Apr. 25, 1978.

Patent 4,148,031. Phase Conjugation Method and Apparatus for an Active Retrodirective Antenna Array. Filed Mar. 16, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,149,233. Circuit for Automatic Load Sharing in Parallel Converter Modules. Filed Sept. 15, 1977. Patented Apr. 10, 1979. Not available NTIS.

Patent 4,149,278. Compact Artificial Hand. Filed Sept. 27, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,423. High-Temperature Microphone System. Filed Apr. 28, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,521. Solar Energy Collection System. Filed Jan. 25, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,665. Bonding Machine for Forming a Solar Array Strip. Filed Nov. 4, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,149,938. Electrochemical Detection Device. Filed Nov. 30, 1977. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,150,425. Module Failure Isolation Circuit for Paralleled Inverters. Filed Feb. 9, 1978. Patented Apr. 17, 1979. Not available NTIS.

Patent 4,151,086. Fluid Sample Collection and Distribution System. Filed Apr. 4, 1978. Patented Apr. 24, 1979. Not available NTIS.

Patent 4,151,612. Spacesuit Mobility Knee Joints. Filed Mar. 3, 1978. Patented May 1, 1979. Not available NTIS.

Patent 4,153,476. Double-Sided Solar Cell Package. Filed Mar. 29, 1978. Patented May 8, 1979. Not available NTIS.

Patent 4,154,084. Coal-Shale Interface Detection. Filed Nov. 3, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,154,912. In Situ Self Cross-Linking of Polyvinyl Alcohol Battery Separators. Filed Apr. 19, 1978. Patented May 15, 1979. Not available NTIS.

OFFICE OF NAVAL RESEARCH
Field Support Group,
Room 221, Arlington, Va. 22217

Patent 4,031,488. Multiple Polarization Switch. Filed Apr. 5, 1976, patented June 21, 1977. Not available NTIS.

Patent 4,132,681. Fluorinated Polyether Network Polymers. Filed Oct. 29, 1976, patented Jan. 2, 1979. Not available NTIS.

Patent 4,142,212. Two-Dimensional Surface Acoustic Wave Image Scanning. Filed Aug. 5, 1977, patented Feb. 27, 1979. Not available NTIS.

Patent 4,146,332. Spectrometer with Electronic Readout. Filed Apr. 19, 1977, patented Mar. 27, 1979. Not available NTIS.

Patent 4,150,340. High-Power Microwaves from a Non-Isochronous Reflecting Electron System (NIRES). Filed Mar. 22, 1978, patented Apr. 17, 1979. Not available NTIS.

Patent 4,152,492. Water Cooled Bipolar Battery Apparatus. Filed July 31, 1978, patented May 1, 1979. Not available NTIS.

Patent 4,152,772. Apparatus for Performing a Discrete Cosine Transform of an Input Signal. Filed Dec. 20, 1976, patented May 1, 1979. Not available NTIS.

Patent 4,154,532. High Precision Optical Alignment System. Filed April 20, 1978, patented May 15, 1979. Not available NTIS.

Patent 4,154,631. Equilibrium Growth Technique for Preparing PbS sub x Se sub (1–x) Epilayers. Filed May 27, 1977, patented May 15, 1979. Not available NTIS.

Patent 4,154,658. Purification of 1,1-Dimethyl Hydrazine (UDMH) Containing Formaldehyde Dimethyl Hydrazone. Filed July 3, 1978, patented May 15, 1979. Not available NTIS.

Patent 4,155,065. Optic Scattering Acoustic Transducer. Filed Sept. 12, 1977, patented May 15, 1979. Not available NTIS.

Patent 4,158,684. Method of Making Ceramic Prosthetic Implant Suitable for a Knee Joint. Filed Dec. 13, 1976, patented June 19, 1979. Not available NTIS.

Errata

All reference to Patent No. 4,184,469 to Charles W. Haldeman, et al of Massachusetts for TRANSPARENT INTERNAL COMBUSTION ENGINE appearing in the Official Gazette of Jan. 22, 1980 should be deleted since no patent was granted.

All reference to Patent No. 4,185,312 to James Bjordahl of California for TRANSDUCER POSITIONING APPARATUS appearing in the Official Gazette of Jan. 22, 1980 should be deleted since no patent was granted.

All reference to Patent No. 4,186,231 to Mark R. Weitzman of Ohio for DECORATIVE ACOUSTICAL PANEL FOR CEILINGS AND WALLS appearing in the Official Gazette of Jan. 29, 1980 should be deleted since no patent was granted.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 26, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-16-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	8-22-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

OFFICIAL GAZETTE NOTICE

EXTENSION OF TIME FOR FILING NOTICES OF OPPOSITION TO MARKS PUBLISHED IN THE OFFICIAL GAZETTES DATED FEBRUARY 5, 1980, FEBRUARY 12, 1980, and FEBRUARY 19, 1980

Because of printing difficulties, the Official Gazettes dated February 5, 1980, February 12, 1980, and February 19, 1980 will not be issued on those dates. In addition, the Official Gazette dated February 19, 1980 will be issued before the Official Gazette dated February 12, 1980.

The schedule for issue of these Official Gazettes is as follows:

Official Gazette Dated	Will Be Issued On or About
February 5, 1980	February 26, 1980
February 19, 1980	February 26, 1980
February 12, 1980	February 28, 1980

Because of the delays in mailing these Official Gazettes, additional time will be permitted for filing Notices of Opposition to marks published in these issues. The due dates for Notices of Opposition are as follows:

Date of Official Gazette	Final Date for Filing Timely Notice of Opposition
February 5, 1980	March 27, 1980
February 19, 1980	March 27, 1980
February 12, 1980	March 31, 1980

February 15, 1980
Date

Patricia W. Lewis
Acting Assistant Commissioner
for Trademarks

REISSUES

FEBRUARY 26, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,221

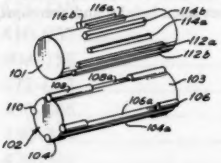
DOUGH SHEET SPREADER

Isabel L. Moreno, Oceanside, Calif., assignor to Edward F. Ruiz, San Dimas, Calif.

Original No. 3,748,079, dated Jul. 24, 1973, Ser. No. 66,734, Aug. 25, 1970. Application for reissue Nov. 17, 1977, Ser. No. 852,363

Int. Cl.[2] A21C *3/04*; B28B *21/52*

U.S. Cl. 425—190 **3 Claims**



3. An extrusion die for viscous material fed thereinto under pressure comprising: an adjustable cooperatng roller pair, the first roller of which contains a plurality of bars of differing dimensions on the outer periphery thereof, said bars each having an indentation in the mediate portion thereof, and the second roller of which contains a plurality of bars on the outer periphery thereof, said first and second roller bars being so dimensioned that at least one second roller bar fixedly and partially nests into the indentation of a corresponding first roller bar in sealing relationship to form a die through which viscous material under pressure may be extruded.

Re. 30,222

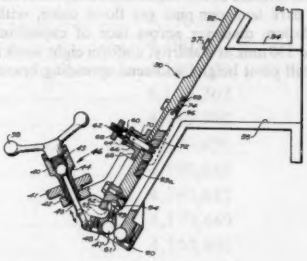
DOUGH SHEET SPREADER

Edward F. Ruiz, 959 W. Covina Blvd., San Dimas, Calif. 91773, and Isabel L. Moreno, Oceanside, Calif., assignors to Edward F. Ruiz, San Dimas, Calif.

Original No. 3,748,079, dated Jul. 24, 1973, Ser. No. 66,734, Aug. 25, 1970. Application for reissue Nov. 17, 1977, Ser. No. 852,364

Int. Cl.[2] A21C *3/04*

U.S. Cl. 425—190 **2 Claims**



1. A sheet spreader for viscous material comprising: an enclosed vessel having an inlet and an egress connected by an interior passageway for the movement of viscous materials therethrough, said passageway being so dimensioned as to diverge generally outwardly in a first plane and to converge generally inwardly in a plane normal to said first plane as the passageway progresses from said inlet toward said egress, said vessel egress comprising an extrusion die means, means for mounting said vessel so that the longitudinal axis of said passageway distends downwardly at about 60° from the horizontal, and in addition, means associated with said vessel for removing entrained gases from said viscous material being extruded prior to extrusion through said die means, said degassing means extending into said passageway between said inlet and said egress and comprising a plate extending in a biased, touching relationship to the material moving through said passageway and adapted to move in a direction substantially normal to the flow of material through the passageway in accordance with the variations in the material density, whereby variable movement of said plate against said material will drive out the gases entrained therein.

PLANT PATENTS

GRANTED FEBRUARY 26, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,505

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 27, 1978, Ser. No. 963,851
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Tempo and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; dark lavender pink ray floret color, with minimal color oxidation; diameter across face of capitulum ranging from 110 to 130 mm. at maturity; uniform eight week flowering response; tall plant height; and semi-spreading branching pattern.

4,506

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 27, 1978, Ser. No. 963,852
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Pot O'Gold and particularly characterized as to uniqueness by the combined characteristics of incurved capitulum form, reflexing at full maturity; decorative capitulum type; bronzy yellow ray floret color; diameter across face of capitulum ranging from 100 to 125 mm. at maturity; uniform 8 week flowering response; short plant height; and semi-upright branching pattern.

PATENTS

GRANTED FEB. 26, 1980

ERRATA

For CLASS	See PATENT NO.
433–225	4,189,834
433–214	4,189,835
433–127	4,189,836
433–057	4,189,837
433–167	4,189,838
433–004	4,189,839
128–742	4,190,033
139–435	4,190,067
126–419	4,190,199
410–037	4,190,262
408–188	4,190,388
422–063	4,190,420
430–066	4,190,445
430–214	4,190,447
430–539	4,190,449
435–172	4,190,495
435–007	4,190,496
264–046.4	4,190,572
548–236	4,190,584
585–361	4,190,610
585–361	4,190,611
585–378	4,190,612
525–215	4,190,613
525–106	4,190,614

PATENTS

GRANTED FEB. 26, 1980

ERRATA

PATENTS

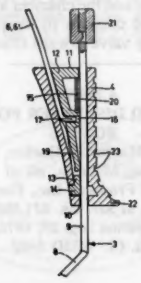
GRANTED FEBRUARY 26, 1980

GENERAL AND MECHANICAL

4,189,787
HIGHLY STRETCHABLE GLOVE AND FORM FOR MAKING SAME
Benjamin Stansbury, Beverly Hills, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 31, 1977, Ser. No. 846,911
Int. Cl.[2] A41D *19/00*; A61B *19/04*
U.S. Cl. 2—163 **6 Claims**

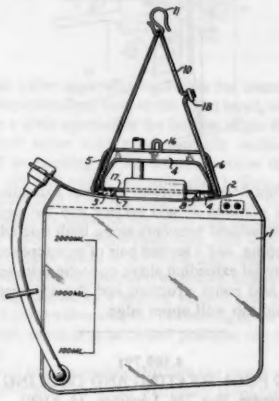
1. A highly stretchable glove with at least one finger having a front and a back, wherein the improvement comprises: a multidirection ovaled finger that has a fingertip area corresponding approximately to a midpoint of a wearer's fingernail ovaled in a side to side direction; and a knuckle area that is ovaled in a direction from a front to rear of the glove finger.

4,189,788
HEADSET
Walter Schenke, Postbauer, and Gerhard Krauss, Stein, both of Fed. Rep. of Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt, Fuerth, Fed. Rep. of Germany
Filed Nov. 13, 1978, Ser. No. 960,187
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 7808135[U]
Int. Cl.[2] A42B *1/06*; H04M *1/05*
U.S. Cl. 2—209 **6 Claims**



1. A headset comprising: a headband, a pair of ear pieces one at each end of said band, a pair of fork members each having one end secured to one of said ear pieces and a shank portion extending away from said one end, and means for coupling each of said fork member shank portions to one end of said headband, said last mentioned means comprising a support member having an upwardly tapering opening passing therethrough, said tapering opening terminating in a slot at the lower end of said support member and terminating in a wide mouth at the upper end of said support member, said fork member shank and portions of said headband extending into said opening, and a wedge member extending into said opening from said wide mouth between said shank and said headband portion and engaging and resiliently urging said shank and headband portions toward opposite surfaces of said support member defining said opening.

4,189,789
URINE COLLECTION CONTAINER WITH COUPLING FOR SUSPENSION LINE
Jack H. Hofstetter, Anaheim, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Aug. 25, 1978, Ser. No. 936,758
Int. Cl.[2] A47K *11/02*; B42F *13/04*
U.S. Cl. 4—144.1 **6 Claims**

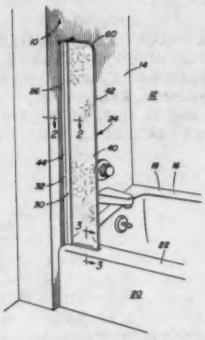


1. A urine collection container, wherein the improvement comprises: a rigid handle with a grasping bar and two spaced apart depending legs which have lower end portions pivotally connected to the container; each leg having an opening adjacent to a lower end of the leg and a slot leading to this opening from an edge of the handle, and each slot being peripherally oriented relative to such opening and having a shape for non-threaded insertion of a suspension line adapted to suspend the container without pulling out of the handle opening.

4,189,790
SHOWER SHIELD
Carson W. Masters, III, 52 E. Union Blvd., Bethlehem, Pa. 18018
Filed Oct. 6, 1978, Ser. No. 949,421
Int. Cl.[2] A47K *3/14*; *3/22*
U.S. Cl. 4—149 **1 Claim**

1. In combination with a tub-shower enclosure including an upright structural member defining one upright side of an entrance and exit opening for said enclosure and including a tub outer side wall extending horizontally away from said structural member and including an upper edge defining the lower extremity of said opening, an elongated upstanding panel structure including upstanding opposite longitudinal marginal portions, one of said marginal portions being transversely widened relative to the remainder of said panel structure and defining a generally planar edge surface extending along said one marginal portion and disposed generally normal to the plane of said panel structure, said surface being of a width appreciably greater than the width of the other longitudinal marginal portion of said panel structure and including a length of double sided adhesive stripping adhesively secured

thereover and generally centered relative thereto with the opposite side edges of said stripping spaced inwardly of the corresponding longitudinal marginal portions of said surface, the adhesive side of said stripping remote from said surface being adhered to said structural member with the lower end edge of said panel structure closely overlying and extending along said upper edge of said tub outer side wall, a pair of



moisture sealing beads of sealant material extending between said marginal portions of said surface and the opposing surfaces of said structural members along both side edges of said adhesive stripping, and a second pair of moisture sealing beads of sealant material extending along opposite sides of the lower end edge of said panel structure and the adjacent opposing portions of said tub wall upper edge.

4,189,791

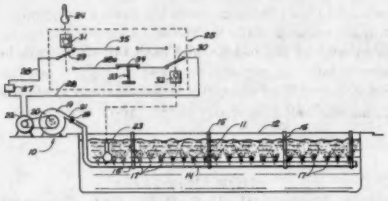
SWIMMING POOL HEATING AND COOLING SYSTEM

Gifford W. Dundas, Box 735, Lewiston, Id. 83501

Filed Jan. 5, 1979, Ser. No. 1,066

Int. Cl.[2] E04H *3/16, 3/18*

U.S. Cl. 4—172 **7 Claims**



1. Apparatus for heating or cooling water in a swimming pool, comprising:

a powered air pump having an air intake and a forced air discharge;

an air delivery manifold tube having an open end attached to the forced air discharge of said pump and adapted to be submerged within the pool;

a plurality of perforations formed through the tube for allowing escape of air;

air temperature sensing means for sensing ambient air temperature;

water temperature sensing means for sensing the water temperature within the pool;

control means operatively connecting the air temperature sensing means and water temperature sensing means for activating the powered air pump when the temperature differential between the ambient air and water in the pool reaches a first prescribed value and for deactivating the powered air pump when the temperature differential between the air and water in the pool reaches a second prescribed value.

4,189,792

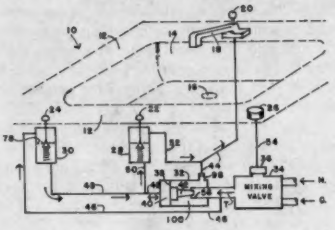
PUSH BUTTON CONTROLLED WATER SYSTEM

Carlos W. Veach, 8921 Ashcroft Ave., Los Angeles, Calif. 90048

Filed Sep. 18, 1978, Ser. No. 942,992

Int. Cl.[2] E03C *1/04*

U.S. Cl. 4—192 **10 Claims**



1. In a water supply system for a basin, such as a bathroom lavatory, kitchen sink, or the like, including a spout for delivering tempered water, consisting of a mixture of hot and cold water, to the spout for discharge into the basin, the improvements, comprising;

(a) a water source including water mixing apparatus communicating with supplies of hot and cold water adapted to mix same in selected proportions for delivery therefrom of water at a desired temperature,

(b) a supply valve communicating between the mixing apparatus and the spout having a movable wall forming a part of an expansible chamber and operatively connected to a metering valve for varying the rate of flow of the delivered water, dependent upon the volume of water in said chamber,

(c) a first normally closed control valve communicating with the chamber adapted to be opened by a manual controls to decrease its volume and permit the metering valve to move toward open position, and

(d) a second normally closed control valve communicating between the source and the chamber adapted to be opened by another manual controls to increase its volume and move the metering valve toward closed position.

4,189,793

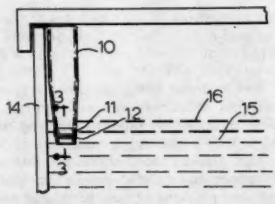
AUTOMATIC LIQUID DISPENSER FOR AN INVERTED BOTTLE

Clifton L. Williamson; Harvey L. Hocker, both of Fort Bragg, and John M. Alcamo, Modesto, all of Calif., assignors to Northwest Sanitation Products, Inc., Fort Bragg, Calif.

Continuation-in-part of Ser. No. 631,385, Nov. 12, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,921

Int. Cl.[2] E03D *9/02*

U.S. Cl. 4—228 **20 Claims**



1. A liquid dispenser for use in dispensing liquid from an

inverted bottle having a neck into a tank at times when water in the tank drops below a normal, buoying level, including in combination:

a hollow annular stationary member having a neck-engaging portion joined by an annular radially inwardly-extending diaphragm to an inner tubular seat portion having at its ends an upper seat edge and a lower seat edge, and

a movable member comprising a piston that is slidable in said tubular seat portion and otherwise widely spaced from said stationary member, said movable member having an upper portion and a lower portion spaced apart by a charge-measuring portion and having adjacent its upper end first seating means for engaging the tubular seat portion and said upper seat edge to prevent flow therebetween, said charge-measuring portion, when said movable member is in a lower position with said upper edge engaged, then discharging its charge below said lower seat edge, said movable member having adjacent its lower end second seating means for engaging the tubular seat portion and said lower seat edge, said charge-measuring portion when said movable member is in an upper position with lower seat edge engaged, then receiving its charge, being open above said upper seat edge,

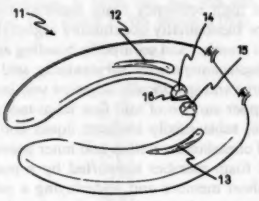
said lower portion of said movable member including a buoying portion having a first vertical wall, an outwardly extending bottom wall at the lower end, of the first vertical wall and an upwardly extending vertical wall extending up from said bottom wall to provide an annular chamber having a small drain opening through said bottom wall, said buoying portion serving to buoy said movable member up to said upper position when the water in said tank rises to a normal storage level, said charge-measuring portion then being filled by liquid from said bottle, and serving by its weight and that of slowly draining water in said annular chamber to carry said movable member down to said lower position when the water level drops, and then to discharge the liquid contents of said measuring portion, which flow down said first wall from said measuring portion.

4,189,794

TOILET SEAT

Pedro Alemán-Muciño, Lluvia No. 317, Mexico City 20, Mexico

Filed Jun. 15, 1978, Ser. No. 915,835
Claims priority, application Mexico, Jun. 23, 1977, 169584
Int. Cl.[2] A47K *13/00*
U.S. Cl. 4—237 3 Claims



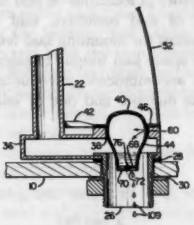
1. A toilet seat comprising a body having spaced side portions and at least a rear portion together defining an opening, a first pair of spaced posterior protuberances each have a longidutinal section which has substantially the shape of half avoid and projecting inwardly into said opening from said rear portion and a second pair of lateral protuberances upstanding one on the uppermost surface of each said side portion, posterior protuberances being spaced apart and located to engage one between the coccyx and the upper and outer portions of the great right sacrosciatic ligament and the other between the coccyx and the upper and outer portions of the great left sacrosciatic ligament of a person seated on said seat.

4,189,795

TOILET FLUSH VALVE

Angelo J. Conti, 411 Lakewood Cir., Apt. B-915, and Ira Pile, 411 Lakewood Cir., both of Colorado Springs, Colo. 80910

Filed Sep. 20, 1978, Ser. No. 943,880
Int. Cl.[2] E03D *1/14*
U.S. Cl. 4—324 13 Claims



8. In flush valve apparatus for toilets for controlling water flow from the toilet flush tank to the toilet bowl, which apparatus includes a drain opening in the bottom of the flush tank and a hollow ball valve with a substantially enclosed chamber therein and an opening in the bottom portion thereof to the exterior of the ball valve, wherein said hollow ball valve is movably positioned over the drain opening in the toilet flush tank for selectively opening the drain and closing the drain to the flow of water out of the flush tank, and wherein said ball valve is buoyant in water in the flush tank when said chamber is substantially filled with air and displaced upwardly from said drain opening, including a sealing surface near the upper extremity of the ball valve adapted for seating in the drain pipe of the flush tank when it is in closed position, the improvement comprising:

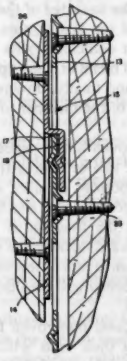
an air bleed hole extending through the upper portion of the ball valve near its upper extremity from the chamber to the exterior of the ball valve and under said sealing surface, and flow rate adjustment means on said air bleed hole for selectively adjusting the flow rate of air out of said ball valve.

4,189,796

ADJUSTABLE MECHANISM FOR GUARD RAIL OF A BUNK BED

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

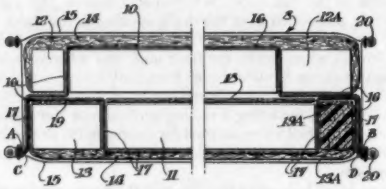
Filed Jul. 24, 1978, Ser. No. 927,487
Int. Cl.[2] A47C *17/40, 21/00*
U.S. Cl. 5—8 6 Claims



1. In a bunk bed having vertically-extending end post members and a horizontal guard rail member releasably connected

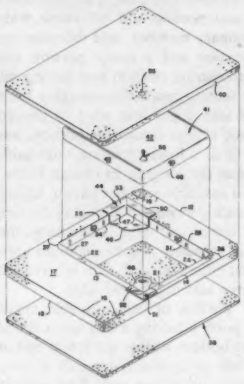
to said post members, a pair of horizontally spaced apart releasable locks connecting said guard rail member to said post members, each lock comprising a female part on one of said members and a male part on the other, said male part comprising a relatively elongated, generally planar plate having a plurality of longitudinally aligned, spaced notches therein each defining tongue-engaging edges whereby said tongue is positionable at a plurality of locations on said female part to adjust the relationship of said members, said female part being equipped with means for mounting said female part on one of said members to space said tongue engaging edges from said one member to accommodate introduction of said tongue between said one member and one of said tongue engaging edges.

4,189,797
MATTRESS
Steven Glackin, 309 E. Main St., Wilmington, Del. 19804
Filed Apr. 24, 1978, Ser. No. 899,090
Int. Cl.[2] A47C 27/22, 27/14, 27/12
U.S. Cl. 5—448 **1 Claim**



1. A mattress comprising
(a) a top resilient member,
(b) a bottom resilient member, each member containing two vertical slits through the member, which slits are positioned parallel with the ends of the member and which extend in length from between about ⅓ to ⅔ of the width of the members,
(c) a semirigid member between said top and bottom member containing two slits which substantially coincide with the slits in said bottom member,
(d) a nonwoven fabric laced through the slits of the bottom member and the semirigid member, said fabric extending from the bottom edge of one end of the bottom member upwardly over the top edge of the same end, then extending between said top and bottom member to downward through the first coinciding slits in the bottom member and the semirigid member, then upward through the other coinciding slits and finally, downward from the top edge of the other end of the member to the bottom edge of the same end,
(e) a second nonwoven fabric partially overlaying the first nonwoven fabric and extending from the bottom edge of one end of the bottom member upwardly over the top edge, then between said top and bottom members to and upward through the first slit in the top member, then extending downward through the second slit and between the top and bottom layers to the top edge of the other end of the bottom member and then down to the bottom edge of said other end,
(f) the first and second nonwoven fabrics being affixed to each other along their ends which terminate along the bottom edges of each end of the bottom member,
(g) felt made of cotton surrounding the outside of the resilient members, and
(h) a flexible, strong cover surrounding the entire assembly.

4,189,798
FOAM MATTRESS WITH FLOATATION TORSO SUPPORT
Donald C. Vessey, 7331 Kolb Pl., Dublin, Calif. 94566
Filed Apr. 20, 1978, Ser. No. 898,115
Int. Cl.[2] A47C 27/08, 27/14
U.S. Cl. 5—451 **11 Claims**



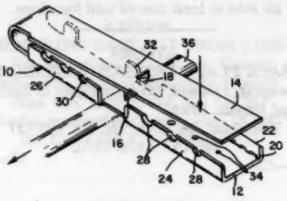
1. A laminated mattress assembly having an area and perimeter dimensioned for use as a sleeping bag comprising:
a. a first foam material member having an area and outer perimeter substantially registering with said area and perimeter of said mattress assembly, having generally uniform thickness, formed with upper and lower planar surfaces, and formed with an opening therethrough defined by inner perimeter walls dimensioned and located within said mattress assembly area to underlie the torso only of a person and leaving a substantial structural supporting border area between said inner perimeter walls and all points of said outer perimeter including a head carrying portion and a leg carrying portion;
b. a bottom sheet member dimensioned for coextensive registration with said first foam member and secured by bonding against relative lateral displacement substantially over said entire lower surface area and specifically adjacent said inner perimeter of said lower surface of said first foam member;
c. a second high resiliency foam material member dimensioned for substantially coextensive registration with said first foam member and secured by bonding against relative lateral displacement over substantially said entire upper surface area and specifically adjacent said inner perimeter of said upper surface of said first foam member;
d. a flexible, substantially inelastic liquid container for receipt and containment within said inner perimeter walls of said first foam member supported by a portion of, said bottom sheet member and underlaying a portion of said second foam member, and dimensioned so that when filled with liquid it occupies substantially the entire opening in said first foam member;
e. valve means connected to said liquid container for filling or emptying said container;
f. a passage formed in said second foam mattress connecting the outer surface of said mattress assembly and said chamber for filling said liquid container; and
g. said bottom sheet member and said second foam member have substantial resistance to elongation in all lateral directions so that when a weighted body rests on said mattress assembly said bottom sheet member and said second foam member are tensioned and resist lateral displacement of said inner perimeter walls.

4,189,799

CABLE STRIPPING TOOL

Melvin P. Litehizer, Jr., Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 5, 1978, Ser. No. 912,710
Int. Cl.[2] B25F *1/00*; H02G *1/12*
U.S. Cl. 7—107 6 Claims



1. A tool for preparing ends of housewiring cable for termination, said tool comprising:

a unitary, elongated metal member folded upon itself to form a lower cutter portion and an upper backup portion;

a series of gauging apertures formed in one of said lower or upper portions;

a cutting blade formed in each said portion extending inwardly towards the opposite portion, said blades being transverse to the elongated dimension of said tool and being offset from each other sufficiently to be out of engagement;

a first abutment upwardly turned along one marginal edge of said lower cutter portion, said abutment having a sharpened free edge; and

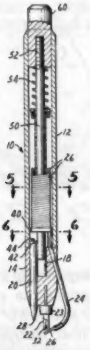
at least one stripper portion upwardly turned along an opposite marginal edge of said lower cutter portion, said at least one stripper portion having at least one arcuate cutting surface in a free edge thereof, whereby insulation jacketing of said cable is slit by said blades and cut off by said abutment and insulation on individual conductors of said cable is stripped by said stripper.

4,189,800

SELF-CONTAINED BREADBOARD WIRING TOOL

Terry E. Roswell, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 6, 1978, Ser. No. 958,269
Int. Cl.[2] B25B *25/00*; H01R *43/00*
U.S. Cl. 7—107 1 Claim



1. Breadboard wiring tool comprising:

(1) a shaft having a longitudinal axis and threaded at one end;

(2) cutting means at the end of said shaft distal to said threaded end and displaced laterally from the axis thereof;

(3) an elongated supply spool of insulated wire on said shaft;

(4) cylindrical retaining means screwed to the threaded end of said shaft;

(5) spring means urging said supply spool away from said retaining means;

(6) a hollow head movably penetrated by said shaft and with retaining means for holding said cutting means in and protruding from said head and stop means for preventing entrance of said spool on said shaft into said head;

(7) a tip with shallow and deeper slots therein on said head offset from the center thereof and with said shallow slot radially aligned on said head;

(8) guide means conducting insulated wire from said supply spool toward said shallow slot; and

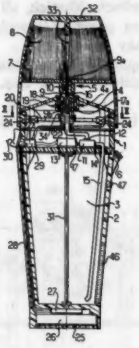
(9) cylindrical casing enclosing said shaft and supply spool secured to said head and extending over at least a portion but not all of said cylindrical retaining means.

4,189,801

FLUID PRODUCT PROJECTION APPARATUS FOR MAINTENANCE AND TREATMENT OF ALL SURFACES AS WELL AS THE BODY

Marie M. Lanusse, Embassy Ter. (Apt. 208), 3440, rue Durocher, Montreal H2X 2E2, Canada

Filed Feb. 28, 1979, Ser. No. 16,338
Int. Cl.[2] A46B *13/04*
U.S. Cl. 15—29 8 Claims



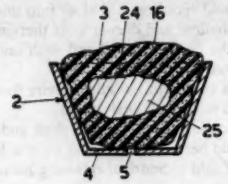
1. In an apparatus for projecting a fluid product for the maintenance or care and the treatment of all surfaces, including the skin of the human body, comprising: a casing with a container portion for the fluid product; a working head comprising a brush movable in rotation on the said casing; means for projecting the fluid product into the said working head, the said projecting means being constituted by a hollow shaft jointly rotatable with the working head and opening into the latter, the said hollow shaft being connected to the outlet of a pump whose inlet is connected to a suction tube dipping into the said container, the improvements consisting in that in the said casing is mounted a flux-conductive oscillating plate or the like jointly rotatable with the hollow shaft and the end faces of which extend each in confronting relationship to an electromagnet secured to the internal surface of the said casing, the said electro-magnets being connected to means for alternately energizing the same so as to impart to the said working head an alternating rotary motion.

4,189,802

BATH SPONGE HAVING INCORPORATED THEREIN A CORE OF DETERGENT SUBSTANCES, AND METHOD AND APPARATUS FOR MANUFACTURING SAME

Simon G. Lansbergen, D. Liekensland 42, Keerbergen, Belgium

Filed Jul. 26, 1978, Ser. No. 927,968
Claims priority, application Italy, Aug. 3, 1977, 21969/77[U]
Int. Cl.[2] C11D *17/04;* B29C *24/00;* B32B *5/18*
U.S. Cl. 15—104.93 11 Claims



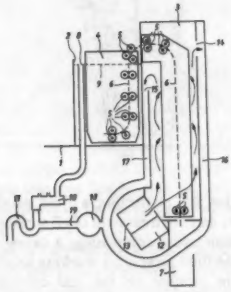
1. A bath sponge provided with an internal cavity cut therein, at least one detergent substance in solid state filling said cavity, the material of said sponge surrounding said cavity being uninterrupted, and said detergent substance which when introduced into said cavity is in fluid state, being slightly diffused into the superficial porous layer of said sponge defining said cavity.

4,189,803

WET-PROCESSING APPARATUS FOR PHOTOGRAPHIC EMULSION CARRIERS WITH NOVEL DISPOSAL OF DRIER-UNIT EXHAUST AIR

Helmut Schausberger, Unterhaching; Erwin Geyken, Neubiberg, and Peter Dawidowitsch, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 930,537
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735085
Int. Cl.[2] G03D *3/13*
U.S. Cl. 15—302 7 Claims



1. An improved apparatus for the wet-processing of photographic emulsion-carrying material, the apparatus being of the type comprising

a washing unit at which photographic emulsion-carrying material is washed with wash water, the washing unit including a wash-water tank containing a body of wash water and an outflow conduit system communicating with the wash-water tank for continual withdrawal of spent wash water from the wash-water tank, the wash water in the wash-water tank being wash water at a first location and the wash water in the outflow conduit system being wash water at a second location,

and a drier unit in which photographic emulsion-carrying material is dried, the drier unit including means for contacting photographic emulsion-carrying material with heated drying air and for exhausting used drying air from the drier unit,

the improvement comprising:

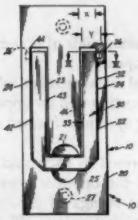
exhaust-air transmitting means receiving the exhausted drying air from the drier unit and transmitting the exhausted drying air into at least one of said locations.

4,189,804

BACK PLATE AND BAIL ASSEMBLY

Dale L. Flowerday, Holland, Mich., assignor to Keeler Corporation, Grand Rapids, Mich.

Filed Mar. 24, 1978, Ser. No. 889,737
Int. Cl.[2] A47B *95/02*
U.S. Cl. 16—126 25 Claims



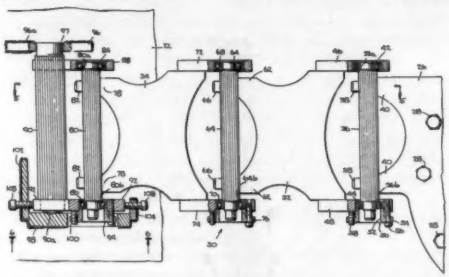
1. A bail and back assembly for furniture pulls on a furniture component and the like including a bail and a single back member, said bail being generally U-shaped and having a pair of legs, a first of said legs having a relief or a cutaway portion which in a first position of said bail will permit flexing of said first leg for removal of said first leg from said back member; and said relief or cutaway portion being orientable with respect to said back member to a second position wherein separation of said bail and back assembly and flexing of said first leg is resisted when a pulling force is applied to said bail for pulling on the furniture component.

4,189,805

ADJUSTABLE HINGE INSTALLATION

Harold A. Backus, Wynnewood, Pa., assignor to NL Industries, Inc., Hightstown, N.J.

Filed Aug. 23, 1978, Ser. No. 935,914
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—130 24 Claims



1. A hinge assembly for supporting a door on a door support, said hinge assembly comprising an elongated pivot rod attached to said door, upper and lower rotatable bearings connected to said pivot rod near its upper and lower ends, an elongated alignment bar extending close to and substantially parallel with said pivot rod and arranged to mount said upper and lower bearings, an upper support plate supported by and

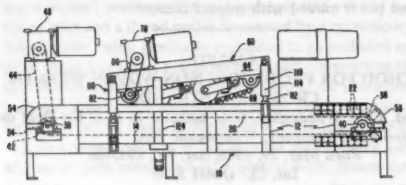
extending out from said door support, a rocking pivot interconnecting said upper support plate and said alignment bar, a horizontally extending lower support plate extending out from said door support, the lower end of said alignment bar resting slideably on and supported by said lower support plate and a lateral adjustment mechanism mounted on said lower support plate and adjustable to shift the lower end of said alignment bar horizontally on said lower support plate.

4,189,806

REMOVING BACK FAT FROM LOIN

Woeldrik P. Van Heyningen, Edmonton, Canada, assignor to Swift Canadian Co., Limited, Etobicoke, Canada

Filed Feb. 9, 1978, Ser. No. 876,343
Claims priority, application Canada, Feb. 15, 1977, 271794
Int. Cl.[2] A22B 5/16; A22C 17/12
U.S. Cl. 17—52 **8 Claims**



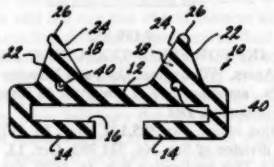
1. An improved method for removing back fat from loins, said method comprising: first separating loin portions with excess fat from both carcass halves; placing each said loin portion centrally and in an evenly balanced manner on an arcuate conveying surface with the fat side against said surface; engaging the fat with penetrating members centrally of said surface; moving each loin portion in a given direction at a given speed toward a relatively fixed symmetrically arcuate knife blade, said blade being positioned in the path of said loin portion and adjustable toward and away from said conveying surface so as to separate a fat layer of a desired constant thickness from said loin portion; and positively gripping the upper surface of said loin portion along two courses prior to reaching said knife blade and propelling same in said given direction and at said given speed; and continuing to grip and propel said upper surface of said loin portion across said knife blade to a point in said direction therebeyond.

4,189,807

CLAMP

Robert M. Byerly, Burbank, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Continuation of Ser. No. 741,938, Nov. 15, 1976, abandoned.
This application Mar. 20, 1978, Ser. No. 888,313
Int. Cl.[2] B65D 65/10; F16L 3/12
U.S. Cl. 24—16 R **3 Claims**



1. A cushion for clamping cables of different cross-sectional area, including,

a body portion defined by a pair of opposite ends,

a pair of projections extending from one side of the body portion in spaced relationship to each other and provided with a solid construction, the projections being disposed in inwardly spaced relationship from the ends of the body portion to provide for a support by the ends of the body portion and a controlled bending of the projections when the cable is clamped between the projections, the projections being made from a resilient material to act as resilient springs in response to the force exerted by the cable and shaped to bend only in directions away from each other in accordance with the cross-sectional area of the cables exerting forces on the projections,

a pair of lips extending from the body portion and toward each other in spaced relationship to the body portion,

the projections being disposed on the body portion and being shaped to control the bending of the projections by the cables disposed in the space between the projections and no ridges being disposed on the body portion between the projections,

each of the projections being provided with outboard and inboard sides in substantially a pyramidal shape and extending at a shallower angle from the body portion at the inboard side of the projections than at the outboard side of the projections, and

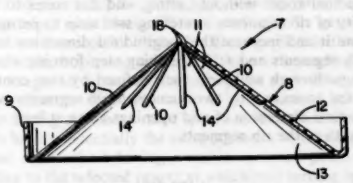
a bore having relatively small dimensions provided near the base of the pyramid defined by each projection to facilitate the controlled outward bending of each projection and the damping of vibrations by the cables.

4,189,808

RETAINER AND CLOSURE FOR A GARBAGE CAN LINER BAG

Theodore G. Brown, 5005 Stockton Blvd., Sacramento, Calif. 95820

Filed Sep. 20, 1978, Ser. No. 944,144
Int. Cl.[2] B65D 77/10
U.S. Cl. 24—30.5 R **4 Claims**



1. A retainer and closure for a garbage can liner bag consisting of a body member formed of a thin elastic material having a plurality of slots which intersect with one another intermediate of their ends to form resilient prongs, said prongs tapering in width toward the point of intersection of said slots to define adjacently disposed pointed ends, said prongs being adapted to be spread by the insertion of a part of the mouth of a can liner bag through the body from one side thereof for restricting the bag mouth to retain it around the exterior of the open top of a garbage or trash can in which the remainder of the bag is disposed, the remainder of the bag mouth being adapted to be drawn through the body member in the same direction, after the bag is substantially filled and the bag mouth has been detached from the can, for completely closing the bag ready for disposal with said retainer or closure supported solely by the bag, said body member being conical, and including an upturned rim surrounding the enlarged part only of the cone and forming a finger-hold.

4,189,809

FASTENER DEVICE AND METHOD OF MANUFACTURING

Juan N. Sotos, Barcelona, Spain, assignor to Repla International S.A.H., Luxembourg, Luxembourg

Filed Nov. 10, 1977, Ser. No. 850,357
Claims priority, application Spain, Nov. 10, 1976, 453,167
Int. Cl.[2] A44B 17/00; B29F 3/00; B29C 17/02, 17/14
U.S. Cl. 24—204 7 Claims

1. Fastener means comprising, a strip having on a first one of its faces a plurality of longitudinally aligned and spaced apart upstanding fastener segments, said strip including a plurality of flat longitudinal zones disposed on both sides of said aligned fastener segments, said segments including a base comprising two legs whose ends are integral at their edges relative to two contiguous ones of said flat zones, said strip having spaced openings extending therethrough intermediate said spaced apart fastener segments, said fastener segments including an enlarged top of greater size than the lateral extent of said openings between the flat zones and being longitudinally spaced from each other a distance at least equal to their longitudinal dimension, so as to define said openings by two successive fastener segments and two contiguous uncut flat zones with said openings adapted to receive identical said fastener segments from the other of its faces.

4. A method of manufacturing a fastener device comprising: extruding thermoplastic material to provide a strip having a plurality of longitudinally extending rows of ribs projecting from one face of said strip, forming said strip with a plurality of flat longitudinal zones connected to said rows of longitudinal ribs by two legs forming between them a longitudinal channel, the ends of said legs being integral at their edges with two contiguous flat zones, said longitudinal ribs provided with an enlarged top of a size greater than the space between adjacent ones of said flat zones, cutting said ribs transversely throughout their height down to the top surface of said flat longitudinal zones without cutting said flat zones to form a plurality of rib segments, stretching said strip to permanently elongate it and increase the longitudinal dimension between said rib segments and said stretching step forming elongated openings through said strip each defined by two contiguous uncut flat zones and by two successive rib segments with the longitudinal dimension of said openings being at least equal to the length of the rib segments.

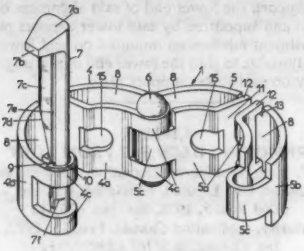
4,189,810

ASSEMBLY ELEMENTS, INTER ALIA FOR SCAFFOLDING

Bernard Beziat, Coye-La-Foret, France, assignor to Societe Nouvelle des Echafaudages Tubulaires Mills, Le Bourget, France

Filed Jun. 1, 1978, Ser. No. 911,455
Claims priority, application France, Jun. 23, 1977, 77 19272
Int. Cl.[2] A44B 24/00
U.S. Cl. 24—249 R 10 Claims

1. An assembly element for scaffolding or the like, used for clamping a cylindrical element after said clamping element is engaged axially or laterally on the cylindrical element for securing one or more transverse elements on to the cylindrical, said assembly element comprising two half-rings interconnected by two pins to define a complete ring, each said half-ring having a resiliently deformable inner part adapted to bear against the surface of the cylindrical element and to deform as said inner part bears against that surface, thereby to securely engage that surface and each said half-ring having an outer part adapted to co-operate with said inner part to bound spaces for receiving other elements, at least one of said two pins being



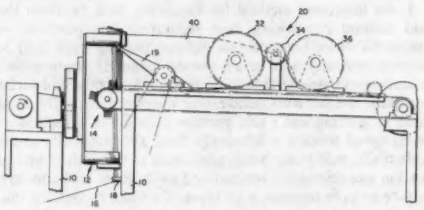
so shaped as to be adapted to tighten said two half-rings when said one pin is moved with respect thereto.

4,189,811

METHOD FOR PRODUCING NON-WOVEN WEBS OF CROSS-LAID STRANDS

Paul M. Cole, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1978, Ser. No. 891,400
Int. Cl.[2] D04H 3/04
U.S. Cl. 28—100 6 Claims



1. A method for converting a plurality of equally spaced strands cross-laid between spaced pairs of outer and inner rows of juxtaposed strand-restraining elements in an angled pattern to form a web having a predetermined width along the selvedge of the web into an orthogonal pattern, said method comprising: moving the pairs of rows at the same lineal speed; moving the outer row of each pair of rows out of the plane of travel of the inner row then back into the plane of travel of the inner row a lag distance approximately equal to said predetermined width, thereby displacing formerly juxtaposed strand-restraining elements relative to each other and permitting a portion of said strands to pass along said selvedge by sliding around displaced strand-restraining elements.

4,189,812

JET FOR FLUID TEXTURING YARN

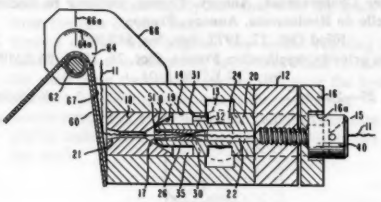
Brian M. Agers, Wilmington, Del., and Maurice C. Todd, Glen Mills, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 885,172, Mar. 10, 1978, abandoned, which is a division of Ser. No. 731,982, Oct. 13, 1976, Pat. No. 4,096,612. This application Feb. 16, 1979, Ser. No. 13,192
Int. Cl.[2] D02G 1/16
U.S. Cl. 28—272 2 Claims

1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a nozzle block having a conical entrance located in said bore at said outlet end, and a yarn guiding

element sealing off said bore at the yarn inlet end of the body for introducing yarn into said jet, said element having a passage therethrough for guiding yarn from the yarn inlet of the body past the gas inlet through a flat exit end of said element to the conical entrance of the nozzle block, said element being provided with means for movement toward the conical entrance of the nozzle block for stringup and away from the nozzle block for normal fluid texturing operation, there being a space between said flat exit end of said element and said conical entrance for throttling the flow of pressurized fluid that flows into said space and out through the nozzle block to create air pressure less than atmospheric at the end of said element, thereby inducing an inward flow of atmospheric air through said passage to draw said yarn through said passage for stringup, the improvement for increasing said inward flow of atmospheric air through said passage to facilitate drawing yarn through said passage during stringup of the yarn comprising: a venturi positioned in said passage, said venturi having a flared inlet and a flared outlet connected by a constriction, said flared outlet being gradually expanded at an included angle of from about 6 to about 8 degrees from said constriction through the flat exit end of said element, the ratio of the maximum cross sectional area of said flared outlet to the cross sectional area of said constriction being in the range of from about 3 to about 9.

2. In a yarn texturing jet including a body having yarn inlet and oulet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a first venturi located in said bore at said outlet end, and a yarn guiding element sealing off said bore at the yarn inlet end of the body for introducing yarn into said jet, said element having a passage therethrough for guiding yarn from the yarn inlet of a body past the gas inlet through the flat exit end of said element to the conical entrance of the first venturi, said element being provided with means for movement toward the first venturi for stringup and away from the first venturi for normal fluid texturing operation, there being a space between said flat exit end of said element and said first venturi for throttling the flow of pressurized fluid that flows into said space and out through the first venturi to create air pressure less than atmospheric at the end of said element, thereby inducing an inward flow of atmospheric air through said passage to draw said yarn through said passage, the improvement for increasing said inward flow of atmospheric air through said passage to facilitate drawing yarn through said passage during stringup of the yarn comprising: a second venturi positioned in said passage, said second venturi having a flared inlet and a flared outlet connected by a constriction, said flared outlet being gradually expanded from said constriction through the flat exit end of said element, the ratio of the maximum cross sectional area of said flared outlet to cross sectional area of said constriction being in the range of from about 3 to about 9.



4,189,813

METHOD FOR MANUFACTURING SINGLE STAGE GEARED TURBINES

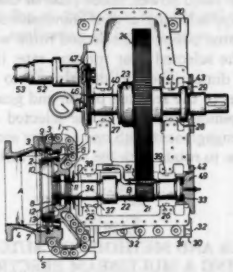
Gerd Ostermann, Nüremberg; Erwin Stiegler, Feucht; Erich Schliermann, and Peter Hirsch, both of Nüremberg, all of Fed. Rep. of Germany, assignors to AEG-Kanis Turbinenfabrik GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 804,016

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625903

Int. Cl.[2] B23P *15/00*

U.S. Cl. 29—156.8 R **13 Claims**



1. In a method for assembling a single stage geared turbine composed of a turbine casing, an assembly within the casing including a set of steam delivery nozzles and a rotor wheel provided with buckets and defining an impulse turbine stage of the Curtis type, a gear casing in which the turbine casing is overhung mounted, a gear rotatably mounted in the gear casing, and a pinion mounted for rotation with the turbine stage and drivingly engaging the gear, for operation at a selected power and gear rotation rate, the improvement wherein said turbine is formed by selecting said rotor wheel from a small number of rotor wheels having respectively different wheel pitch diameters and corresponding maximum rated powers differing by about 2000 HP between successive diameters and each having a rated speed inversely proportional to its associated pitch diameter and optimally corresponding to the maximum rated power relative to its high velocity ratio, a uniform blading being associated with each wheel of a given pitch diameter and, except for the bucket blade profiles in the border regions at the beginning and end of the corresponding output power range, all rotor wheels having the same blade profile configuration in their first row of buckets, and said rotor wheels having associated rated speed values such that all rotor wheels have substantially the same optimum velocity ratio, the selected rotor wheel having a maximum rated power corresponding to the selected power at which said turbine operates; selecting said set of steam delivery nozzles from a plurality of steam delivery nozzle sets for the selected rotor wheel, each nozzle being dimensioned with variable opening ratio $(F_{min}/txh)_{nozzle}$ in order to adapt it in each case to the at least minimum required reaction depending on the parameters and the throughput of steam, the selected nozzle set having an opening ratio providing the minimum required reaction; assembling the selected rotor wheel with the selected nozzle set to form a selected turbine stage assembly; selecting a turbine casing from a plurality of turbine casings each dimensioned to correspond to a respective wheel pitch diameter, the selected turbine casing corresponding to the diameter of the selected rotor wheel; mounting the selected turbine stage assembly in the selected turbine casing; selecting a gear casing from a plurality of gear casings each dimensioned to correspond to a respectively different value for the spacing between the axes of a pinion and a gear; selecting a pinion from a plurality of pinions having respectively different diameters staggered according to a standard series, the gear casing dimensions differing between gear casings in steps approximately equal in num-

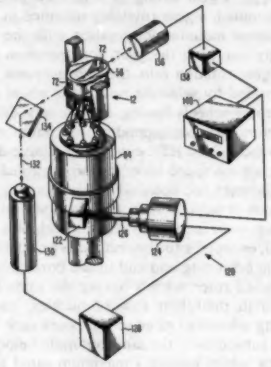
ber to the number of different pinion diameters so that all possible pinion/gear casing combinations yield a number of gear output speeds extending over the entire range of desired gear rotation rates and the entire desired rated power range, the pinions of larger diameter being provided for the rotor wheels having the higher rated powers, the pinions of smaller diameter being provided for the rotor wheels having the lower rated powers, and a respective group of pinions being provided for each rotor wheel having a rated power in the medium range; selecting that one of the pinions which is provided for the selected rotor wheel and which corresponds to the selected power and the rated power/speed ratio of the selected turbine stage assembly; selecting a gear dimensioned in accordance with the selected pinion and selected rotor wheel rated speed to produce the selected gear rotation rate; the selected gear casing being dimensioned to correspond to the spacing between the axes of the selected pinion and gear; and mounting the selected pinion and gear in the selected casing in power transmitting engagement with one another and connecting the selected pinion to rotate with the selected turbine stage assembly.

4,189,814

APPARATUS AND METHOD FOR AUTOMATICALLY ALIGNING A MULTIBEAM ELECTRON GUN ASSEMBLY WITH A CATHODE-RAY TUBE BULB

James G. Ottos, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,497
Int. Cl.[2] H01J *9/18*
U.S. Cl. 29—25.16 **10 Claims**



1. A method of aligning a multibeam cathode-ray tube electron gun assembly with at least a portion of a cathode-ray tube bulb, wherein an element of said gun assembly has two accurately positioned alignment apertures therein, a line connecting the centers of the alignment apertures being transverse to the central longitudinal axis of said gun assembly, said method including:

positioning said tube bulb in known orientation relative to a light source with said gun assembly being located adjacent to said tube bulb having its central longitudinal axis substantially aligned with the central longitudinal axis of said bulb,

directing light rays toward the alignment apertures from said light source,

rotating said electron gun assembly about its central longitudinal axis,

pulsing said light rays in predetermined relationship with the speed of rotation of said electron gun assembly, and

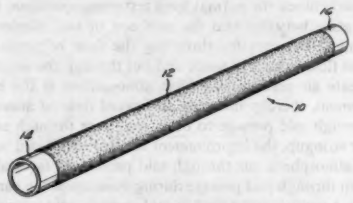
counting a number of light pulses passing through the alignment apertures.

4,189,815

DEVELOPER TRANSPORT ROLL

Terry G. Seelenbinder, Elk Grove Village, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Jan. 15, 1979, Ser. No. 3,201
Int. Cl.[2] B21B *27/02, 31/08;* B60B *15/00*
U.S. Cl. 29—121.8 **5 Claims**



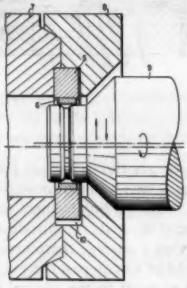
1. A developer feed roll for diazo photocopying machines comprising a roll having a surface of aluminum in which the RMS value of the roughness of the major portion of its surface is between 150 and 350 microinches and in which the thus roughened surface has been subjected to a hard coat anodizing treatment to provide an anodized layer of at least 0.0015 inches in thickness.

4,189,816

COMPOSITE BEARING RACE AND METHOD FOR ITS FABRICATION

M. Roger Chalansonnet, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Oct. 17, 1977, Ser. No. 842,803
Claims priority, application France, Oct. 26, 1976, 76 32199
Int. Cl.[2] B21K *1/04*
U.S. Cl. 29—148.4 C **8 Claims**



1. A method of manufacturing a composite bearing race including an inner and outer ring comprising:

concentrically positioning said inner and outer ring in holder;

deformably assembling said inner and outer ring member by rolling a first at least one ball groove in said inner ring member and deforming said outer ring member such that a second at least one ball groove is radially embedded in said outer ring member; and,

heat treating said deformably assembled inner and outer ring members such that one of said inner member increases more in volume than said outer ring member to provide radial and annular cohesion therebetween wherein said inner ring member comprises 52100 steel in accordance with SAE specification J404 and comprises in weight percent C 0.95 to 1.10—Cr 1.50 to 1.60—Ni≦0.30—Mn 0.25 to 0.40—Si 0.10 to 0.35—P+S≦0.025—remainder: Fe and wherein said outer ring member comprises a low alloyed steel or a plain carbon steel for which the major

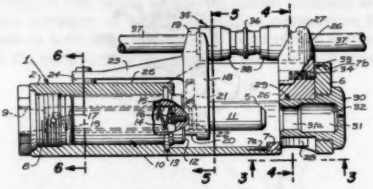
selective factor is that carbon content thereof is less than 0.40 in weight percent.

4,189,817

HYDRAULIC ASSEMBLY TOOL FOR TUBE FITTINGS

Kurt O. Moebius, 30544 Oceanaire Dr., Rancho Palos Verdes, Calif. 90274

Filed Mar. 3, 1978, Ser. No. 883,226
Int. Cl.² B23P *19/04*
U.S. Cl. 29—237 9 Claims



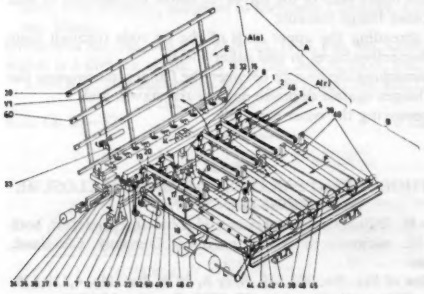
1. A hydraulic tool comprising:
a. a body structure, including a hydraulic cylinder, a housing portion extending axially therefrom, and an end wall terminating the housing portion;
b. a piston received in the cylinder;
c. a shaft extending axially from the piston into the housing portion;
d. a first carrier unit extending radially with respect to the shaft; and restrained in the end wall against angular movement;
e. second carrier unit axially movable with the shaft to and from the first carrier unit;
f. second carrier unit angular movement resisting means including an arm extending in parallel offset relation with the shaft from the second carrier unit over the hydraulic cylinder for sliding engagement therewith; and
g. cooperating tool elements at the radial extremities of the carrier units defining a common axis parallel to the axis of the shaft.

4,189,818

APPARATUS AND METHOD FOR THE ASSEMBLY OF GLASS SHEETS

Yves Lavoisey, Asnieres, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 10, 1977, Ser. No. 850,355
Claims priority, application France, Nov. 15, 1976, 76 34284
Int. Cl.² B25B *27/14*
U.S. Cl. 29—281.5 11 Claims



1. Apparatus for moving plate shaped objects such as glass sheets into juxtaposition comprising a support for each of the plate shaped objects, at least one of said supports being pivotally mounted for fold back movement around at least two axes located near the glass sheet which it supports, each said axis being simultaneously parallel to the other and to the planes of the two supports, and said axes being unequally spaced from the support undergoing fold back movement.

4,189,819

METHOD OF MANUFACTURING METALLIC SPIRALLY WOUND GASKETS

Terence P. Nicholson, Derwentside, England, assignor to Corru-Seals Inc., North Haven, Conn.

Filed Sep. 6, 1978, Ser. No. 939,963
Claims priority, application United Kingdom, Jan. 31, 1978, 3911/78
Int. Cl.² B23P *17/00*
U.S. Cl. 29—417 4 Claims

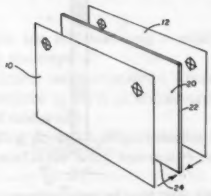
1. A method of manufacturing a metallic spirally wound gasket having an outer centring ring which comprises the steps of spirally coiling a corrugated strip of metallic material to form a sealing element of desired diameter, and surrounding the thus formed sealing element with a centring ring which is or has been formed by spirally coiling a metal strip which is of greater thickness than the sealing element strip and has a corrugated cross-section such that adjacent turns of the spiral sealing element and centring ring fit, without clearance one against the other.

4,189,820

TEMPLATE PATTERN ALIGNMENT

Otto G. Slack, 14 SE. 199th, Portland, Oreg. 97233

Filed Feb. 21, 1978, Ser. No. 879,219
Int. Cl.² B23P *17/00*
U.S. Cl. 29—425 5 Claims



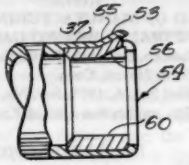
1. A method of promoting reverse-side pattern alignment employing a pair of sheet-like pattern templates intended for use on opposite sides of a substantially planar web to place aligned patterns thereon, where the periphery of the web includes a pair of selected edges that intersect at a known angle, said method comprising
placing such templates in pattern-aligned, confronting, parallel-planar relationship,
simultaneously trimming a pair of intersecting margins in the confronting templates to produce matching edges therein which intersect at such known angle, and
fitting the trimmed templates on opposite sides of the web with the matching edges in the templates flush with the selected edges in the web.

4,189,821

METHOD OF MANUFACTURING SCREW JACK TUBES

Robert H. Potter, Benton Harbor, Mich., assignor to Auto Specialties Manufacturing Company, St. Joseph, Mich.

Division of Ser. No. 834,272, Sep. 19, 1977, Pat. No. 4,127,343.
This application May 15, 1978, Ser. No. 906,097
Int. Cl.[2] B23P 11/00
U.S. Cl. 29—432 7 Claims



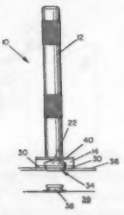
1. A method of manufacturing a tube assembly for use in jacks and the like, comprising the steps of forming an annular recess in one end of a hollow tube member of given wall thickness to a predetermined radial extent and axial depth within the tube, inserting in the formed recess a bushing of diametric extent less than the recess diametric extent and an axial length less than the recess axial length, crimping a tip of the recessed tube member wall over the outer end of the bushing, cutting the tube member and bushing along at least two parallel, axially oriented lines for an axial distance less than the axial length of the bushing, and radially outwardly deforming that portion of the tube member wall and bushing wall located between the cuts so as to form a male key and to lock the bushing inside the tube member against relative angular rotation.

4,189,822

METHOD OF FASTENING AND UNFASTENING SNAP FASTENERS

Irving W. Perline; Leonard Trapido, both of Kew Gardens; John J. Rottenkolber, Bronx, and Michael L. Rottenkolber, Mount Vernon, all of N.Y., assignors to Andrew Adams Developing Corporation, Bronx, N.Y.

Division of Ser. No. 748,472, Dec. 8, 1976, Pat. No. 4,096,618.
This application Mar. 28, 1978, Ser. No. 891,052
Int. Cl.[2] B23P 11/02
U.S. Cl. 29—453 2 Claims



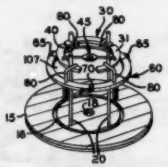
1. The method for fastening together the mating male and female members of a snap fastener in which each of said members is secured to material which materials are to be joined by the fastener, and in which at least one of said members has a distal portion of greater lateral width than an adjacent portion thereof and which distal portion is spaced from the material to which said one member is secured by said adjacent portion comprising engaging the exterior of said one member with said adjacent portion between the diverging prongs of a fork-type pronged element secured to one end of a handle, said engaging being effected with the prongs of said pronged element positioned between said distal portion and the material to which said one member is secured, manipulating the handle to align said engaged member with the other member of said fastener, and applying pressure to said engaged member through said handle to snap said engaged member into fastened relationship with the other member of the fastener.

4,189,823

METHOD AND APPARATUS FOR ASSEMBLING REELS

Theodoor Neyenhuys, P.O. Box 3627, Visalia, Calif. 93277

Filed May 30, 1978, Ser. No. 910,650
Int. Cl.[2] B23P 19/04; B23Q 3/00
U.S. Cl. 29—464 13 Claims



1. A method of assembling a reel having a pair of substantially circular flanges each having a circular groove concentric thereto and a plurality of bores within the groove with the bores of each flange being correspondingly positioned in their respective flanges, a plurality of staves having opposite ends fitted to the grooves in the flanges in a cylindrical assembly to form a drum, and tie rods having opposite ends receivable in corresponding bores of the flanges to draw the flanges toward each other against the staves comprising

A. inserting the tie rods through their respective bores in one flange,

B. positioning the one flange in a substantially horizontal attitude with the tie rods upwardly extended therefrom,

C. suspending an inner ring assembly of an outer diameter substantially equal to the inside diameter of the circular grooves in the flanges on the upper ends of the tie rods in a plane substantially parallel to the one flange,

D. suspending an outer ring assembly of an inside diameter substantially equal to the outside diameter of the circular grooves in the flanges on the inner ring assembly and in substantially parallel downwardly spaced concentric relation thereto defining an annular stave receiving channel therebetween,

E. inserting the lower ends of the staves downwardly into the groove of said one flange with the upper ends thereof extended through the channel and with the staves in interengaging cylindrical assembly.

F. removing the inner assembly with the upper ends of the staves upwardly extended from the outer assembly,

G. fitting the groove of the other flange downwardly over the upper ends of the staves for rested engagement of said other flange thereon,

H. threading the upper ends of the tie rods through their respective bores in said other flange,

I. tensioning the tie rods between the flanges to compress the flanges against opposite ends of the staves, and

J. removing the outer assembly.

4,189,824

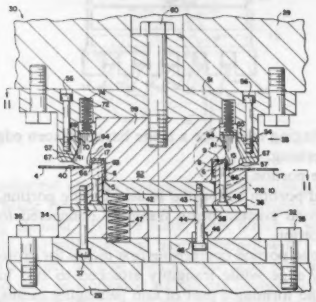
METHOD AND APPARATUS FOR MAKING CLOSURE CONSTRUCTION

Glenn W. Dillon, Crete, and Albert H. Lindell, Hazelcrest, both of Ill., assignors to Stock Equipment Company, Cleveland, Ohio

Division of Ser. No. 903,539, May 8, 1978, Pat. No. 4,135,639.
This application Aug. 25, 1978, Ser. No. 936,887
Int. Cl.[2] B21D 39/00; B23P 11/02
U.S. Cl. 29—522 R 7 Claims

1. The method of making a closure construction comprising placing together a flange member having an axially extending

portion with an axially extending opening and a previously formed thread and a radially extending metal flange portion rigidly connected to said axially extending portion, and a metal container wall having a major wall portion and a previously formed minor offset wall portion including an axially extending wall portion that closely surrounds the outer periphery of the flange portion of said flange member and a radially extending wall portion having an opening that surrounds the axially extending opening of the flange member and that bears against the adjacent surface of said flange portion of said flange member, then applying to said flange portion transversely thereof and axially of said flange member at spaced locations around the outer periphery of said flange portion compressive forces sufficient to form depressions in the metal of said flange portion at the periphery of said flange portion at such locations



and to force the metal of said flange portion at such locations radially outwardly to form generally radially extending protuberances while holding the radially extending portion of said offset portion of said container wall against said flange portion of said flange member and while constraining against outward radial movement said axially extending portion of said container wall at locations offset from said radially extending portion of said container wall and adjacent those at which said protuberances are formed, whereby the metal of the container wall is deformed while said protuberances are formed to firmly engage said protuberances and extend around and under said protuberances and clamp them against said radially extending portion of said container wall thereby to firmly secure said flange member in said container wall against any movement relative to said container wall.

4,189,825

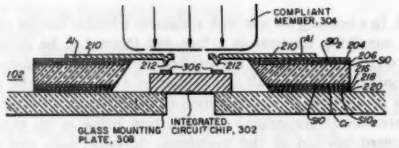
INTEGRATED TEST AND ASSEMBLY DEVICE

David R. Robillard, Westboro, and Robert L. Michaels, Marlboro, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 666,826, Mar. 15, 1976, Pat. No. 4,096,348, which is a division of Ser. No. 583,739, Jun. 4, 1975, Pat. No. 3,984,620. This application Sep. 1, 1977, Ser. No. 829,770

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—574 **3 Claims**



1. The method comprising the steps of:

(a) providing an interconnection substrate comprising the steps of:

(i) forming a plurality of apertures in a wafer of semiconductor material, at least some of said apertures being adapted for receiving an integrated circuit chip; and

(ii) forming a plurality of conductive leads upon at least one surface of said wafer with ends of at least some of said conductive leads extending over said apertures having a pointed tip at said ends facing said aperture;

(b) providing a plurality of integrated circuit chips, each one of said chips having a plurality of conductive bonding pads;

(c) positioning said chips in said apertures and aligning said pointed tips with said bonding pads;

(d) applying pressure to said ends of said leads forcing said pointed tips to make electrical contact with said bonding pads;

(e) testing the integrated circuit chips through said electrical contacts prior to bonding the leads to the pads;

(f) replacing integrated circuit chips which fail said testing; and

(g) thereafter bonding said pointed tips to said bonding pads.

4,189,826

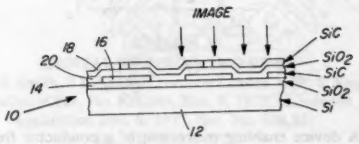
SILICON CHARGE-HANDLING DEVICE EMPLOYING SIC ELECTRODES

Frank T. J. Smith, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 775,147, Mar. 7, 1977. This application Dec. 22, 1978, Ser. No. 972,618

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—590 **2 Claims**



1. A method for use in fabricating a solid state imaging device comprising the steps of:

(a) heating a doped monocrystalline silicon wafer in an oxygen atmosphere to form an oxidic crust of silicon on the surface of said wafer;

(b) growing a first layer of polycrystalline silicon on said oxidic crust, said layer being less than 5 microns in thickness;

(c) selectively exposing part of said first silicon layer to a hydrocarbon and dopant source, thereby to convert said silicon layer part to a first pattern of transparent silicon carbide electrodes;

(d) growing a second polycrystalline silicon layer over said electrodes;

(e) heating said second silicon layer in an atmosphere of oxygen to oxidize said silicon layer;

(f) growing a third layer of polycrystalline silicon on said oxidized second silicon layer, said third silicon layer being less than 5 microns in thickness; and

(g) selectively exposing part of said third silicon layer to a hydrocarbon and dopant source, thereby to convert such silicon layer part to a second pattern of silicon carbide electrodes which are cooperable with said first pattern of electrodes.

4,189,827

TREATMENT OF ELECTROCHEMICAL CELL COMPONENTS WITH LITHIUM TETRACHLOROALUMINATE (LIALCL4) TO PROMOTE ELECTROLYTE WETTING

James G. Eberhart, Naperville, and James E. Battles, Oak Forest, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,619
Int. Cl.[2] B05D 5/12; H01M 6/36
U.S. Cl. 29—623.1 9 Claims

1. A method of improving the wettability of electrochemical cell components with molten electrolyte consisting essentially of alkali metal halides in a mixture having a melting point in excess of the melting point of $LiAlCl_4$, comprising:

contacting said component with $LiAlCl_4$; and

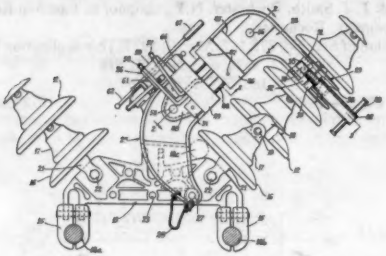
subsequently contacting said component with said molten electrolyte.

4,189,828

CONDUCTOR TRANSFER DEVICE

William H. Chadwick, Jr., Rossville, Ga., assignor to Sherman & Reilly, Inc., Chattanooga, Tenn.

Filed May 28, 1976, Ser. No. 690,918
Int. Cl.[2] H01R 43/00
U.S. Cl. 29—762 2 Claims



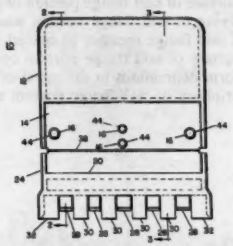
1. A device enabling movement of a conductor from one side to the other of a string of insulators coupled between a tower and a yoke plate, comprising an upper frame having clamping means at its upper end for engaging an intermediate portion of said string, a lower frame having securing means at its lower end for engaging said yoke plate, and means interconnecting the lower end of said upper frame and the upper end of said lower frame for effecting longitudinal movement of said frames relative to each other to permit uncoupling of a selected portion of said string to permit movement of said conductor past said selected portion from one side of said string to the other and subsequent recoupling of said selected portion of said string, wherein said clamping means and said securing means are aligned with each other longitudinally of the device to define a longitudinal axis, and the lower end of said upper frame, the upper end of said lower frame and said means for interconnecting the same are offset relative to said axis, and wherein said clamping means comprises a first semi-circular jaw formed at the upper end of said upper frame and having a lateral extension with a first slot in its outer end, a second semicircular jaw shaped complementally to said first jaw with a lateral extension having a second slot in one end aligned with said first slot and pivotally mounted at its opposite end on said upper frame, a bolt pivotally on said upper frame for movement into and out of said slots, and a nut threaded on said bolt for engagement with said lateral extension of said second jaw.

4,189,829

DUAL PURPOSE CUTTER PACKAGE/GUARD

Clemens A. Iten, Staunton, and Christopher J. Campbell, Richmond, both of Va., assignors to American Safety Razor Company, Verona, Va.

Filed Jun. 6, 1978, Ser. No. 913,164
Int. Cl.[2] B26B 29/00, 3/00
U.S. Cl. 30—151 19 Claims



1. In a packaging means for a blade having a keen edge, an element comprising:

(a) a handle portion,

(b) a second portion connected to said handle portion,

(c) said second portion being frangibly connected to said handle portion,

(d) said second portion comprising first means for protecting said keen edge while frangibly attached to said handle portion and forming a part of said packaging means,

(e) said second portion further comprising first and second sets of teeth for gripping said blade after detaching said second portion from said handle portion,

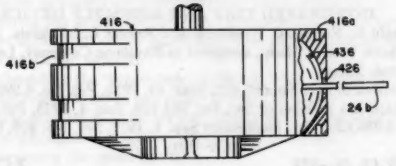
(f) said first and second sets of teeth being arrayed along opposing faces of an edge of said second portion, for providing frictional gripping of said blade therebetween.

4,189,830

SELF-THREADING FILAMENT TRIMMER SYSTEM

Charles B. Pittinger, Jr., 320 Cockeys Mill Rd., Reisterstown, Md. 21136

Continuation-in-part of Ser. No. 713,147, Aug. 10, 1976. This application Jun. 26, 1978, Ser. No. 919,052
Int. Cl.[2] A01D 35/26; A01G 3/06
U.S. Cl. 30—276 8 Claims



1. In a housing for use with a filament trimmer having means for supplying filament to a free end thereof to be threaded outwardly from within the housing through an aperture in a peripheral housing wall and orbited as a cutting end by rotation of the housing on operation of the filament trimmer, the improvement comprising: the aperture being in an extreme outward portion of the peripheral housing wall, and self-threading means for threading said free end through the aperture under centrifugal force on the filament upon said rotation, including vertical-incline structure leading outwardly along the inner surface of said peripheral housing wall to the aperture, and horizontal incline structure leading outwardly along

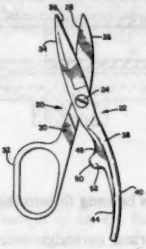
the inner surface of said peripheral housing wall to the aperture.

4,189,831

INDUSTRIAL SCISSORS

Paul A. Sonntag, Doraville, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 24, 1978, Ser. No. 954,150
Int. Cl.² B26B *13/12*
U.S. Cl. 30—232 6 Claims



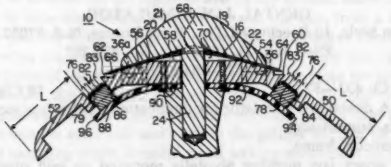
1. Industrial scissors comprising a first cutting element having a blade from which a first handle extends and a second cutting element having a blade from which a second handle extends, and with said first handle formed with a ring through which a finger may be inserted, and with said second handle formed with an elongated arched bar having a convex surface against which a user palm may be snugly seated and pressed and a generally concave surface opposite said convex surface from which a stop unitarily protrudes against a side of which a thumb may be pressed, said first and second cutting elements being pivoted together for unbiased pivotal movement with said first handle ring located adjacent said second handle concave surface and stop.

4,189,832

SHAVING IMPLEMENT

Allan C. Harper, Andover, Mass., and Edmund M. Buras, Jr., Silver Spring, Md., assignors to The Gillette Company, Boston, Mass.

Filed Jun. 19, 1978, Ser. No. 916,679
Int. Cl.² B26B *19/42*
U.S. Cl. 30—34.2 5 Claims



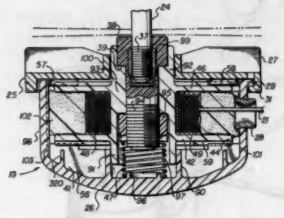
1. A shaving implement comprising:
a handle;
a blade having a cutting edge;
means for supporting said blade, said blade supporting means being attached to said handle and having a flange with a skin contacting surface adapted to distribute shaving force to substantially prevent stretching of said skin;
resilient hair raising means mounted on said flange immediately adjacent to said blade cutting edge for raising and holding hairs in an erect position for cutting by said blade cutting edge; and spring means mounted on said implement for biasing the hair raising means.

4,189,833

APPARATUS FOR CUTTING VEGETATION

James L. Kwater, Birmingham, Ala., assignor to Weed Eater, Inc., Houston, Tex.

Filed Aug. 15, 1978, Ser. No. 934,226
Int. Cl.² A01G *3/06*; A01D *55/18*
U.S. Cl. 30—276 8 Claims



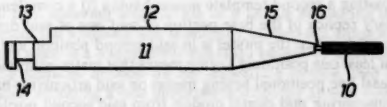
1. Apparatus for cutting vegetation comprising:
drive means including a shaft rotating at a predetermined speed about an axis,
a spool directly connected to said shaft for rotation therewith at said predetermined speed of rotation,
a head member associated with said spool in surrounding relationship thereto, said head member including a peripheral aperture,
at least one flexible non-metallic cutting line coiled on said spool and having a free end thereof extending outwardly of said head member through said aperture and into a cutting plane, and
means for moving said head member to a first position for engagement with said spool and for rotation therewith at said predetermined speed, and for moving said head member to a second position free of engagement with said spool and for rotation of said head member at a speed less than said predetermined speed of rotation of said spool.

4,189,834

DENTAL REINFORCING PINS

Andrew J. Smith, 3 Leighton Crescent, London N.W. 5, England

Continuation of Ser. No. 639,095, Dec. 9, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,831
Int. Cl.² A61K *5/02*
U.S. Cl. 433—225 5 Claims

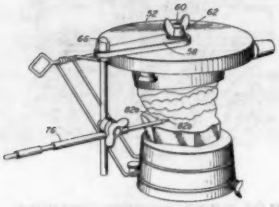


1. A dental anchoring device comprising a threaded portion for self-threading insertion in a bore formed in a tooth dentine, a connecting portion forming an integral unit with said threaded portion and having an elongated shank adapted for direct positive attachment in a powered dental hand-piece, and a weakened portion intermediate the threaded portion and one end of the connecting portion for permitting shearing and separation of the connecting portion from the threaded portion; the free end of the connecting portion having a flat portion and a part annular groove, whereby the connecting portion can be latched in a latching-type dental hand-piece to securely retain the dental anchoring device in the hand-piece without dropping therefrom and when said threaded portion is fully inserted in a bore said weakened portion shears to separate said connecting portion from said threaded portion.

4,189,835
METHOD OF DENTAL SURVEYING

Edward B. Seldin, Boston, Mass., assignor to Massachusetts General Hospital, Boston, Mass.

Filed Oct. 27, 1977, Ser. No. 846,202
Int. Cl.[2] A61C 11/00
U.S. Cl. 433—214 4 Claims



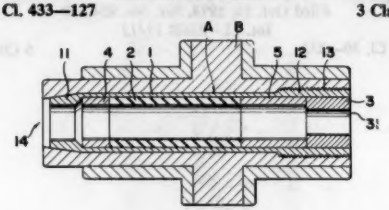
1. A method for preoperative evaluation comprising the steps of:

1. preparing maxillary and mandibular dental models, said models each having a base portion of a given configuration;
2. mounting a articulator base on a dental articulator, said articulator base having at least one positional keying means;
3. placing said models on the articulator in a first position that presents the patient's malocclusion and then temporarily securing the models in said first position;
4. casting a first template means having (i) a complementary replica of the base portion of one of said dental models when the model is in such first position and (ii) at least one positional keying means that mates with said at least one positional keying means of said articulator base;
5. detaching said dental models from said first position;
6. placing said dental models on the articulator in a second position that presents the patient's proposed corrective position and then temporarily securing the models in said second position;
7. casting a second template means having (i) a complementary replica of the base portion of said one of said dental models when the model is in said second position and (ii) at least one positional keying means that mates with said at least one positional keying means on said articulator base;
8. unsecuring said dental models from said second position;
9. placing the base of one of said dental models in the complementary replica thereof in one of said template means and engaging the positional keying means thereof with the positional keying means of articulator base;
10. mounting a stylus assembly with respect to one of said dental models, said stylus assembly including a movable stylus;
11. marking at least one of said dental models with the stylus;
12. substituting the other of said template means for said one of said template means without moving the stylus assembly relative to said one of said dental models;
13. marking again said at least one of said dental models with the stylus; and,
14. determining from the two stylus marks the translational movements required to move said one of said models from the first position to the second position.

4,189,836
CHUCK FOR DENTAL HAND-PIECE

Hiroshi Sugai, and Haruo Ogawa, both of Higashihama Minami, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 3, 1978, Ser. No. 921,230
Claims priority, application Japan, Jul. 4, 1977, 52/88985[U]
Int. Cl.[2] A61C 1/12
U.S. Cl. 433—127 3 Claims



1. A chuck adapted to be snug fit into the rotor of a dental hand-piece comprising:

a substantially cylindrical cartridge case having an inner diameter formed to hold a chuck body and a stopper snug fit to said inner diameter of said cartridge case, said cartridge case having a tapered portion in the form of a truncated cone on the outer circumferential surface at one end thereof and a threaded, thickened outer circumferential surface at the opposite end thereof to enable said cartridge case to be snug fit into the rotor;

a chuck body having an inner diameter and adapted to securely engage the spindle of a dental tool within said inner diameter of said chuck body, said chuck body being snug fit to the inner diameter of said cartridge case;

front and rear collars each having an inner diameter equal to said inner diameter of said chuck body and each snug fit to the inner diameter of said cartridge case at opposite ends of said chuck body, said front and rear collars being adapted to securely engage the spindle of a dental tool within the inner diameters of said collars; and

a stopper having a square cross-sectional inner surface and having a smaller diameter than the inner diameter of said chuck body, said stopper being securely fitted to the inner diameter of said cartridge case at the end opposite the tapered end to thereby provide a stop for the spindle of a dental cutting tool.

4,189,837
DENTAL JAW SIMULATOR

Aaron Stele, 10 Beechwood Ter., West Orange, N.J. 07052

Filed Jun. 23, 1977, Ser. No. 809,297
Int. Cl.[2] A61C 11/00
U.S. Cl. 433—57 18 Claims

1. A dental jaw simulator for duplicating human jaw movements, comprising:

a support frame,

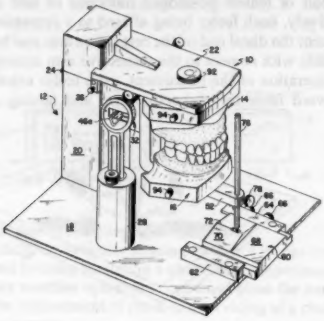
an upper jaw member pivotally mounted on said support frame for receiving an upper dental arch cast,

a lower jaw member mounted on said support frame for receiving a lower dental arch cast, and

means for moving said lower jaw member in protrusive and retrusive directions and in a lateral direction including a universal hinge arrangement in combination with an anterior platform mounted on said support frame and a forward pin member connected to said lower jaw member which engages and is movable relative to said anterior platform,

said anterior platform including first and second sloping planes meeting at the center of said platform to form a crest and sloping downwardly from said crest to the edge of said platform, said forward pin member being movable

on said first and second sloping planes to guide said lower jaw member to move downwardly and in a retrusive direction about said hinge arrangement so that as said



lower jaw member is moved laterally, it drops downwardly and moves in an arc for duplicating the movements of the lower human jaw during lateral movement thereof.

4,189,838

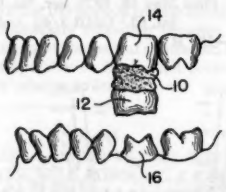
METHOD FOR REMOVING RESTORATIONS FROM TEETH

Richard A. Oliva, 3318 Club Dr., Los Angeles, Calif. 90064

Continuation of Ser. No. 958,051, Nov. 6, 1978, abandoned, which is a continuation of Ser. No. 820,426, Aug. 1, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,441

Int. Cl.[2] A61C *3/16*

U.S. Cl. 433—167 **9 Claims**



1. A process for the removal of a firmly affixed, stuck, binding or cemented dental restoration, and the like, from a tooth of a patient, which comprises: inserting an adhesive substance between the surface of the restoration and at least one opposing tooth of the patient; causing the patient to close his jaws to compress the adhesive substance against the surface of the restoration with at least 25 pounds pressure until a firm adhesive bond is achieved; and causing the patient to open his jaws in a snapping quick forceful rapid jerking movement to apply a reverse force to the adhesive substance in a direction to effect a removal of the restoration from the tooth.

4,189,839

UNIVERSAL ORTHODONTIC PLIERS

John L. Manuel, 960 Alexander Dr., Haysville, Kans. 67060

Filed May 3, 1978, Ser. No. 902,559

Int. Cl.[2] A61C *7/00*

U.S. Cl. 433—4 **12 Claims**

1. A universal orthodontic pliers comprising:

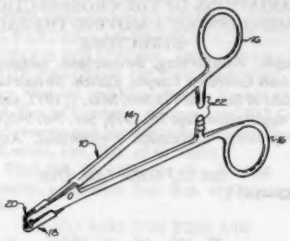
a pair of lever arms pivoted together having handle means at one end and jaw means at the opposite end;

the jaw means including an upper and a lower jaw member;

a pair of transverse mating grooves, one in each jaw member;

a pair of positioning legs on the end of each jaw member oppositely positioned from each other;

a longitudinal slot passing through the upper jaw member between said pair of positioning legs;



a partial longitudinal slot in the lower jaw member oppositely positioned from the slot in the upper jaw member with the pair of positioning legs defining the sides of the partial slot, both slots being of a width less than the width of the transverse grooves.

4,189,840

SCANNING UNIT

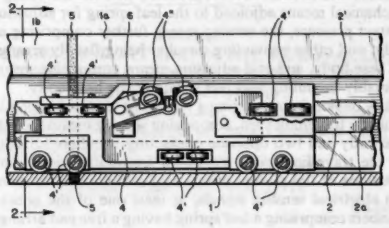
Siegbert Holstein, Stein a.d. Trun, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 873,053

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706926

Int. Cl.[2] G01B *11/04*

U.S. Cl. 33—125 C **6 Claims**



1. In a scanning unit for use in a length measuring device wherein the scanning unit is adapted to translate along a measuring scale in a longitudinal direction guided by a plurality of guide surfaces defined by the measuring device, said guide surface including a first guide surface having at least one joint defining a depression having a predetermined maximum width in the longitudinal direction, said scanning unit including a plurality of longitudinally spaced bearing locations which operate to position the scanning unit with respect to the first guide surface, the improvement comprising:

at least two bearings included in each of said bearing locations, wherein each bearing is mounted in a substantially fixed position with respect to the scanning unit such that, for each bearing location, each of the bearings independently operates to precisely support and position the scanning unit from the first guide surface in the absence of support from other bearings of that bearing location, and further, wherein the bearings of each bearing location are separated in the longitudinal direction by a spacing which is greater than the predetermined maximum width of the depression in the longitudinal direction; and

means for urging the scanning unit toward the first guide

surface such that the bearings included in said bearing locations are urged against the first guide surface.

4,189,841

METHOD AND DEVICE FOR MEASURING THE VARIATIONS OF THE CROSS-SECTIONAL DIMENSIONS OF A MOVING THREAD-LIKE STRUCTURE

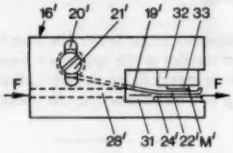
Erich Loepfe, Zollikerberg, Switzerland, assignor to Aktiengesellschaft Gebrüder Loepfe, Zürich, Switzerland

Continuation of Ser. No. 775,369, Mar. 7, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,455

Claims priority, application Switzerland, Aug. 28, 1976, 10882/76

Int. Cl.[2] G01B *7/04, 7/06*

U.S. Cl. 33—147 L **3 Claims**



1. A device for measuring a transverse dimension of a longitudinally travelling yarn, comprising sensing means including two opposite contacting members for contacting the travelling yarn, means for transducing instantaneous variations of the mutual distance of said contacting members into electrical sensing signals, at least one of the contacting members comprising a leaf spring having a free end arranged in opposite relationship to the other contacting member such as to form a measuring gap between said free end and the other contacting member and to exert contact pressure onto the travelling yarn, mechanical means adjoined to the leaf spring for adjusting the contact pressure, the sensing means further comprising a base body, said other contacting member being fixedly arranged at the base body, and said adjusting means comprising means for pivotably mounting said leaf spring at the base body.

2. A device for measuring a transverse dimension of a longitudinally travelling yarn, comprising sensing means including a base body and two opposite contacting members for contacting the travelling yarn, means for transducing instantaneous variations of the mutual distance of said contacting members into electrical sensing signals, at least one of the contacting members comprising a leaf spring having a free end arranged in opposite relationship to the other contacting member such as to form a measuring gap between said free end and the other contacting member and to exert contact pressure onto the travelling yarn, and mechanical means adjoined to the leaf spring for adjusting the contact pressure, and said mechanical adjusting means comprises means for shifting said leaf spring along its lengthwise axis.

4,189,842

COMPACT WIDE-RANGE DIGITAL STRETCH GAUGE

David L. Alter, Hoffman Estates, Ill., assignor to Semi-Mask, Inc., Elk Grove Village, Ill.

Filed Sep. 29, 1978, Ser. No. 946,961

Int. Cl.[2] G01L *7/00*

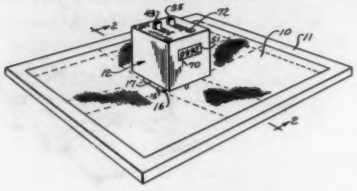
U.S. Cl. 33—149 J **8 Claims**

1. An instrument for detecting the degree of tension of a generally horizontal, tensioned sheet of limp material, said apparatus comprising:

a body including a base having a bottom with two spaced sides and of a size to be positioned on said sheet and having sufficient weight to cause said sheet to be depressed from a planar condition, whereby the sheet slopes upwardly from said sides;

a pair of arms above said bottom and pivotally connected to said body for movement about an axis located in a plane midway between said sides, said arms having distal ends at opposite sides of said plane respectively;

a pair of feelers positioned outboard of said sides respectively, each feeler being affixed to a respective arm adjacent the distal end of the respective arm and being immovable with respect to the respective arm during the normal operation of the instrument, each feeler extending downward from the respective arm and having a distal end



supported on the tensioned material outboard of the respective side, whereby an increase in the tension of the material will cause the feelers to descend closer to the elevation of said bottom and the respective arms to pivot accordingly and a decrease in the tension of the material will cause the opposite movements of the feelers and arms; and

means operatively associated with said arms for detecting and providing a visual indication of the pivotal positions of the arms with respect to each other.

4,189,843

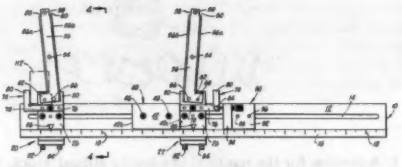
PIPE THREAD GAUGE

John R. Baldwin, Houston, Tex., assignor to Mustang Services Company, Houston, Tex.

Filed May 15, 1978, Ser. No. 905,724

Int. Cl.[2] G01B *3/40, 3/48*

U.S. Cl. 33—199 R **20 Claims**



1. A pipe thread gauge comprising:

an elongated rail;

a pair of blade block assemblies slidably mounted on said rail for longitudinal sliding movement therealong;

means for locking each of said blade block assemblies at a selected location along said rail;

a thread engaging blade pivotally connected to each of said blade block assemblies, said blades having their pivotal axes on said blade block assemblies extending substantially parallel to each other, whereby said blades pivot in substantially the same plane, each of said blades including a toe portion swingable through an arc upon pivotation of the respective blade;

means for selectively setting said blades at a selected angle to each other;

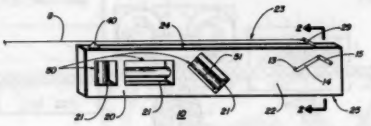
means for selectively spacing said blades from each other a selected distance; and

a stop pin carried on each of said blades and positioned to contact said blade angle setting means and stop further pivotation of the respective blade upon which it is carried when said blade extends at a selected angle to the other blade.

4,189,844
CHALK LINE PROTRACTING TOOL

Robert J. Riggins, Sr., 5150 Mercury Ct., Boise, Id. 83705

Filed Dec. 4, 1978, Ser. No. 965,943
Int. Cl.[2] G01B 19/62
U.S. Cl. 33—414 2 Claims



1. A chalk line protracting tool comprising:

a substantially rectangular housing having a planar top portion, said housing including a chalk line compartment and a closure member operable to open and close the compartment for replacement of chalk and servicing of a chalk line holding means;

a tubular member communicating with the chalk line compartment and terminating above said planar top portion a predetermined distance, said tubular member adapted for threading a chalk line therethrough;

a chalk line holding means including a reel rotatably mounted to the interior of the housing compartment and a handle exterior to the housing, pivotally attached to said reel and adapted to fold downwardly upon, and substantially flush with, the exterior surface of said housing for storage thereof;

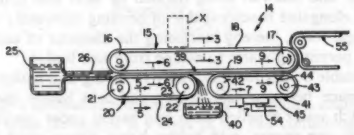
chalk line guide means attached to said housing and extending above the planar top portion a distance equal in distance to the uppermost terminal opening of said tubular member and in unobstructed alignment with the opening;

level indicating means including at least two spirit levels carried by said housing in planar right angular relationship to one another, one of said spirit levels in planar parallel relationship with the top portion of said housing whereby a chalk line rectilinearly extending between the tubular opening and said guide means and protracted beyond said guide means is operable to mark such protraction on a selected surface relative to level.

4,189,845
METHOD AND APPARATUS FOR ELECTROSTATICALLY FORMING A LAYER OF MATERIAL FROM A SLURRY THEREOF

James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Continuation-in-part of Ser. No. 809,945, Jun. 24, 1977, Pat. No. 4,135,307, which is a division of Ser. No. 695,092, Jun. 11, 1976, Pat. No. 4,050,162, which is a continuation-in-part of Ser. No. 541,218, Jan. 15, 1976, Pat. No. 3,977,937, which is a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449. This application Nov. 7, 1977, Ser. No. 849,097
The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.
Int. Cl.[2] F26B 3/34
U.S. Cl. 34—1 40 Claims



1. In a method of forming a layer of material against a movable conveying means from a slurry of a liquid and said material by an electrostatic action so that said layer of material can be subsequently removed in layer form from said conveying means, the improvement comprising the step of disposing a plurality of needle-like projections in said slurry to assist said electrostatic action in forming said layer of material from said slurry against said conveying means.

4,189,846
PROCESS FOR THE CONTINUOUS PRODUCTION OF SOLIDS, IN PARTICULAR PROTEIN CONCENTRATES, FROM AQUEOUS SOLUTIONS, AND APPARATUS FOR THE PRACTICE OF THE PROCESS

Jürgen Fiedler, Nettetal, and Klaus Fricke, Krefeld-Gartenstadt, both of Fed. Rep. of Germany, assignors to GEFI Gesellschaft fur Industriewarme und Verfahrenstechnik mit Beschrankter Haftung, Krefeld, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,554
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2707668
Int. Cl.[2] A23J 1/06; F26B 5/08
U.S. Cl. 34—8 1 Claim

1. A process for the continuous production of protein concentrate from an aqueous solution of blood, comprising the steps of:

(A) discharging superheated steam at a temperature of about 400° C. into a dryer chamber having a centrifugal atomizer disposed therein;

(B) delivering an aqueous blood solution onto the centrifugal atomizer, from which it is discharged in the form of a thin layer of minute droplets of a size smaller than 100 microns, the said droplets being discharged directly into the stream of superheated steam, which dries the droplets while the steam is cooled to about 200° C.;

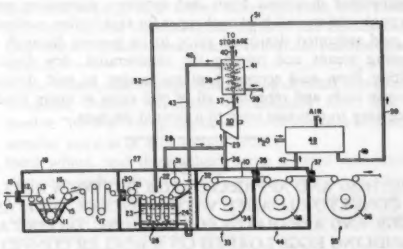
(C) collecting the dried blood at the bottom of the dryer chamber and removing it therefrom; and

(D) delivering the cooled steam to a cyclone separator where entrained solids are removed before the steam is reheated for reuse.

4,189,847
PROCESS AND APPARATUS FOR REMOVAL OF AMMONIA IN A LIQUID AMMONIA FABRIC TREATING SYSTEM

Jackson Lawrence, West Sand Lake, and Harry A. Webb, Menands, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Dec. 15, 1977, Ser. No. 860,921
Int. Cl.[2] F26B 7/00, 3/00, 21/14
U.S. Cl. 34—19 9 Claims



1. The method of recovering ammonia (NH_3) from a fabric web throughout which said ammonia is interspersed comprising the steps of

(a) passing the web through an aqueous ammonia bath of water (H_20) saturated with ammonia (NH_3) maintained within temperature range of 60° F. to 120° F. to cause substantial vaporization removal of a major portion of said ammonia from said web;

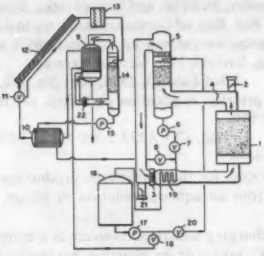
(b) removing the aqueous ammonia solution from the web.

4,189,848

ENERGY-EFFICIENT REGENERATIVE LIQUID DESICCANT DRYING PROCESS

Suk M. Ko; Philomena G. Grodzka, both of Huntsville, and Paul O. McCormick, Athens, all of Ala., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 4, 1977, Ser. No. 821,868
Int. Cl.[2] F26B 3/00
U.S. Cl. 34—32 7 Claims



1. A method of drying a crop comprising the steps of continuously passing a regenerated, liquid desiccant from a storage tank through an absorption column and then through a first heat exchanger back to said tank; passing hot, dry air through a crop bin containing said crop for absorbing moisture therefrom; passing the moist exit air from said bin to said absorption column containing said regenerated, liquid desiccant for removing the moisture from said moist air; passing the exit air from said absorption column through said first heat exchanger for the heating and drying of said air before it is again passed through said bin in a closed-loop fashion; removing said desiccant from said storage tank after it becomes used and saturated with moisture and regenerating it comprising the steps of passing it through a condenser for preheating thereof, through a second heat exchanger for further preheating therof, and through heating means for regenerating (further heating) said saturated desiccant; then passing said regenerated desiccant exiting from said heating means through means for separating the water vapor therefrom; passing said separated water vapor through said condenser where it is condensed to water and passed to a drain, said water vapor being condensed in said condenser serving as an energy recovery mechanism to provide for said preheating of said saturated desiccant passing therethrough to said heating means, passing the now dry, hot, regenerated desiccant from said moisture separating means through said second heat exchanger for said further preheating of said saturated desiccant prior to its passing through said heating means and passing the regenerated, dry desiccant exiting from said second heat exchanger to said desiccant storage tank, and repeating all of said steps as many times as necessary to dry said crop to a desired dryness.

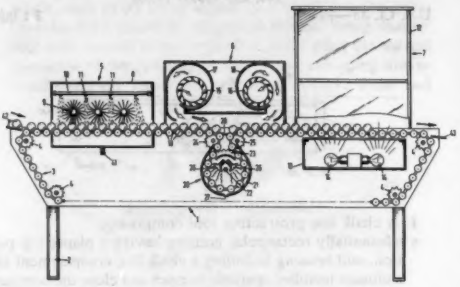
4,189,849

METHOD AND APPARATUS FOR DRYING A ROLLER CONVEYOR LOADED WITH ARTICLES, SUCH AS EGGS, AND APPARATUS FOR WASHING, DRYING AND CANDLING EGGS LOADED ON A ROLLER CONVEYOR

Jelle van der Schoot, Aalten, Netherlands, assignor to Staalkat B.V., Aalten, Netherlands

Filed Oct. 11, 1977, Ser. No. 840,725
Int. Cl.[2] F26B 3/00
U.S. Cl. 34—33 7 Claims

1. In a method of transporting and drying articles supported on an endless conveyor, in which the conveyor and the articles pass through a liquid washing apparatus so that both the conveyor and the articles become wet, and in which drying air is then blown over the wet conveyor and the articles thereon in a drying stage, the improvement which comprises separating a length of the wet conveyor from the articles in the drying stage after partial drying of the articles and of the conveyor, further



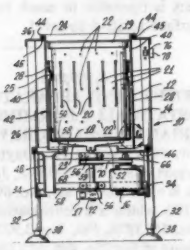
drying the wet length of the conveyor while separate from the articles, returning the length to the drying stage and reengaging the articles with the conveyor in the drying stage for further transport and drying of the articles.

4,189,850

SELF-CENTERING VEGETABLE DRYING APPARATUS

Frank L. Dieterich, 3727 S. Robertson Blvd., Culver City, Calif. 90230, and Stanton Abrams, Los Angeles, Calif., assignors to Frank L. Dieterich, Culver City, Calif.

Continuation-in-part of Ser. No. 794,556, May 6, 1977, Pat. No. 4,103,432. This application Jun. 8, 1978, Ser. No. 913,557
Int. Cl.[2] F26B 17/30
U.S. Cl. 34—58 13 Claims



1. An apparatus for drying vegetables comprising: a plastic basket for containing the vegetables to be dried, said basket being of circular cross section, having an open top end, a closed bottom end and a sidewall that tapers toward said bottom end, said sidewall being divided by slots into generally vertical elongated bands capable of bending outwardly under centrifugal force, thereby increasing the diameter of said basket and permitting water to escape from said basket;

a rotatable holder for removably receiving said basket with a space between said holder and said basket through which water expelled from said basket under centrifugal force can escape, said holder being dimensioned to be engaged by said bands upon outward bending thereof;

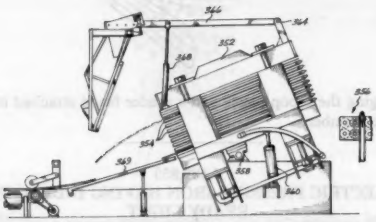
motor means connected to said holder for rotating said holder and said basket and thereby causing water to be expelled through said openings in said sidewall by centrifugal force.

4,189,851

UNLOADING APPARATUS FOR MULTI-OPENING WORK STATION

Byron B. Brookhyser, Milton, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,453
Int. Cl.[2] F26B *9/04, 25/00*
U.S. Cl. 34—236 **7 Claims**



1. In a work station of the type mounted on a base having a plurality of vertically spaced controllable openings for the insertion therein of substantially flat thin sheet workpieces and an unloading apparatus for singulating and discharging the finished sheets, comprising:

means for mounting the work station on at least one bearing positioned at the bottom thereof to provide the work station with a tilting axis about which the entire work station is pivotal from a horizontal orientation to an orientation where the openings are inclined downwardly at an angle of approximately 35° for unloading;

means in operative communication with the work station for sequentially pivoting the work station from its horizontal orientation to its inclined orientation;

means on the work station for sequentially opening each individual opening when the work station is in its downwardly tilted orientation; and

means located substantially adjacent the bottommost opening on the discharge side when the work station is in its downwardly tilted orientation for reducing damage to the singulated discharged sheets.

4,189,852

METHOD OF TEACHING READING

Emilie M. Chatlien, 6653 N. Chicora Ave., Chicago, Ill. 60646

Filed Jun. 13, 1977, Ser. No. 805,742
Int. Cl.[2] G09B *5/00*
U.S. Cl. 35—8 A **7 Claims**

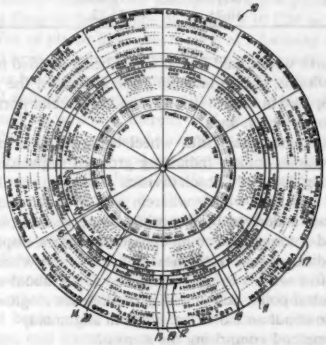
1. In a method of teaching reading in which a student looks at or scans the words in a book or the like containing written or printed words while said words at least in the main are simultaneously being audibly reproduced from previously recorded audible recording means and heard by said student while he looks at or scans said words, the improvement which comprises providing the student with a book or the like having written or printed words, providing said student with means for writing words or statements, providing in the aforesaid recorded material on said audible recording means a plurality of predetermined spaced audible signals each at the end of each of a plurality of the predetermined audible reproductions of words in said book or the like, said audible signals being followed by audible or written instructions to said student to perform writing acts in relation to the audibly reproduced words on said audible recording means, said student, in following said instructions, writing on said means for writing words or statements a word or words or a statement or statements responsive to the aforesaid instructions previously given to said student within given predetermined time periods, after each of said plurality of instructions has been given to said student, whereby a writing is produced by said student which readily permits of being graded to enable the nature of the progress of the student in learning to read to be ascertained and evaluated by the teacher and the student.

4,189,853

ASTROLOGICAL DEVICE

Jack Provenzano, 141 E. 55th St., New York, N.Y. 10022

Filed Oct. 25, 1978, Ser. No. 954,427
Int. Cl.[2] G09B *29/00*
U.S. Cl. 35—44 **10 Claims**



1. An astrological device comprising:

a first base wheel, said wheel being divided into twelve divisions, indicia indicating the signs of the Zodiac being disposed in each division around an annular portion of said wheel;

a second wheel, said second wheel being divided into twelve divisions, indicia indicating sequentially from one to twelve "houses" being disposed in each division around an annular portion of said second wheel;

a third wheel, said third wheel being divided into twelve divisions, indicia indicating grouped sequences of days of the month being disposed in each division around an annular portion of said third wheel, wherein said grouped sequences of days are as follows:

1-12-24,	2-13-25,	3-14-26,	4-15-27,
5-16-28,	6-17-29,	7-18-30,	8-19-31,
9-20,	10-21,	11-22,	and 23;

a fourth wheel, said fourth wheel being divided into twelve divisions, indicia indicating the months of the year being disposed in each division around an annular portion of said fourth wheel; and

a fifth wheel, said fifth wheel being divided into twelve divisions, indicia indicating grouped sequences of years being disposed in each division around an annular portion of said fifth wheel, wherein said grouped sequences of years is derived by disposing a base year in one division and continuing to count consecutive years, disposing each additional year in the next division of the wheel;

said five wheels being arranged so that said indicia on said wheels are simultaneously viewable by an observer and adapted to rotate about a common central point, said wheels providing astrological information about an individual when in alignment.

7. A method for using an astrological device having:

a first base wheel, said wheel being divided into twelve divisions, indicia indicating the signs of the Zodiac being disposed in each division around an annular portion of said wheel;

a second wheel, said second wheel being divided into twelve divisions, indicia indicating sequentially from one to twelve "houses" being disposed in each division around an annular portion of said second wheel;

a third wheel, said third wheel being divided into twelve divisions, indicia indicating grouped sequences of days of the month being disposed in each division around an annular portion of said third wheel, wherein said grouped sequences of days are as follows:

1-12-24,	2-13-25,	3-14-26,	4-15-27,
5-16-28,	6-17-29,	7-18-30,	8-19-31,
9-20,	10-21,	11-22,	and 23;

a fourth wheel, said fourth wheel being divided into twelve divisions, indicia indicating the months of the year being disposed in each division around an annular portion of said fourth wheel; and

a fifth wheel, said fifth wheel being divided into twelve divisions, indicia indicating grouped sequences of years being disposed in each division around an annular portion of said fifth wheel, wherein said grouped sequences of years is derived by disposing a base year in one division and continuing to count consecutive years, disposing each additional year in the next division of the wheel;

said five wheels being arranged to rotate about a common central point, said wheels providing astrological information about an individual when in alignment;

said method comprising the steps of:

locating the birth year of a subject individual on the fifth wheel;

aligning the birth year of said individual with the Zodiac birth sign of said individual on the first base wheel;

locating the current year on the fifth wheel; and

determining the personal year sign of the individual which is aligned on the first base wheel with the current year on said fifth wheel.

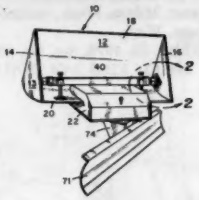
4,189,854

GRADER BLADE ATTACHMENT

John A. Haynes, Sylacauga, Ala., assignor to Danek Industries, Inc., Chattanooga, Tenn.

Filed Jul. 17, 1978, Ser. No. 925,094
Int. Cl.[2] E02F *3/76*
U.S. Cl. 37—117.5 **4 Claims**

1. A grader attachment for a bucket, including a scoop panel having a cutting edge and a pair of oppositely disposed side panels and defining an interior volume, said attachment comprising a bifurcated frame member including a first leg and a second leg cooperatively defining an elongated slot therebetween receiving the cutting edge and a substantial portion of the scoop panel of the bucket to locate an outboard end portion of the first leg within the interior volume defined by the bucket, longitudinally adjustable means for frictionally engaging said side panels, laterally adjustable means frictionally



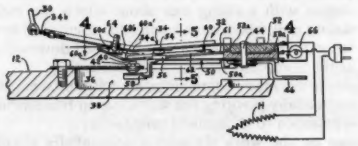
engaging the scoop panel, and a grader blade attached to said frame member.

4,189,855

ELECTRIC PRESSING IRON HAVING INDICATING READY LIGHT

George W. Robinson, Cheshire, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Continuation of Ser. No. 810,502, Jun. 27, 1977, abandoned.
This application Jun. 20, 1978, Ser. No. 917,184
Int. Cl.[2] D06F *75/02, 75/26;* H05B *1/02*
U.S. Cl. 38—82 **13 Claims**



1. In an electric pressing iron having a heater circuit, the iron having mounted on the top of its soleplate a temperature-sensitive switch comprising a pair of superposed, spaced aligned contact blades cantilever-mounted and extending in the same direction, the switch including an upper blade and a lower blade, the blades carrying aligned contact zones, a bimetallic element cantilever-mounted on the soleplate in heat exchange relation therewith and adapted to engage with its distal end the lower blade to move the distal end of said lower blade away from the upper blade in conditions of no-heat-demand to separate the contact zones, temperature control setting means on the iron including means to raise and lower the distal end of the upper blade, the heater circuit being operatively connected in series with the switch, the improvement of a ready light circuit including a third blade mounted cantilever-fashion and disposed between and generally aligned with the other blades, the upper blade and third blade having aligned contact points, the bimetallic element adapted in conditions approaching heat-demand to cause upward movement of the distal end of the third blade to adjacent the upper blade to close the contact points, the ready light and the contact points being operatively connected in series and across the contact zones of the upper and lower blades.

4,189,856

RUG HOOKING RACK

Leonard T. Cookson, 6539 N. 48th St., Paradise Valley, Ariz. 85253

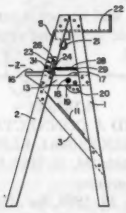
Filed Feb. 22, 1978, Ser. No. 879,874
Int. Cl.[2] D05C *1/02;* D06C *3/08*
U.S. Cl. 38—102.4 **10 Claims**

1. A device for holding base material in a rug hooking operation comprising in combination:

means providing a table surface and frame means holding

said table surface in selected fixed relationship to a base support;

restraining means holding a sheet of base material for said hooking operation in fixed relationship to said table surface and for advancing said sheet of base material stepwise at the will of an operator toward said table surface;



hold-down clamp means adjacent said table surface, having continuously opposed parts relatively shiftable for sandwiching said base material both loosely to permit free sliding thereof through said hold-down clamp means and, alternately, fixedly with respect to said table surface.

4,189,857

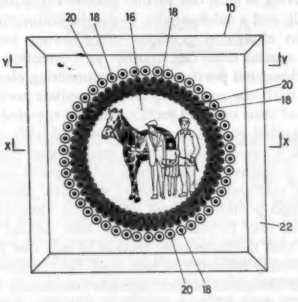
DECORATIVE ARTICLE ASSEMBLY

Kenichi Fujisawa, No. 21, Kano, Yanagi-machi, Gifu City, Gifu Prefecture Japan

Filed Jun. 17, 1977, Ser. No. 807,551

Int. Cl.² G09F *1/10*

U.S. Cl. 40—158 R **1 Claim**



1. A decorative article package for assembly with at least one inlay, such as a tapestry, or a photograph, comprising:

a shaped foundation pierceable by a needle, such as made of plastic foam;

a covering material for said foundation conformingly shaped with said foundation;

a transparent sheet conformingly shaped with said foundation and having peripheral edges permitting a fixed assembly of said foundation with said cover and inlay in parallel adjoinment;

at least a first set of mounting pins, each having a preferably decorative head and a pin-needle,

additional decorative pins, each having a decorative head, preferably of several sizes and configurations, and

a frame conformingly shaped to extend over said foundation.

4,189,858

APPARATUS FOR JOINTLY EXAMINING AND DEPOSITING A PLURALITY OF TRANSPARENT PICTURES

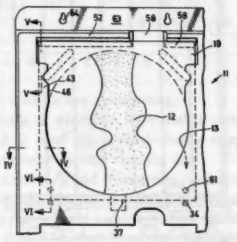
Frank de Bruin, Kalk-Muhlheimer Strasse 400, 5 Koln 80, Fed. Rep. of Germany

Continuation of Ser. No. 723,703, Sep. 16, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 917,852

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541326

Int. Cl.² G09F *1/10*

U.S. Cl. 40—158 B **4 Claims**

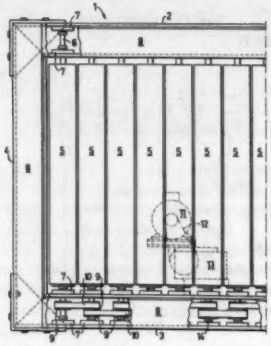


1. Apparatus for easily automatically and manually exchanging while readily retaining for jointly viewing, a plurality of transparent films in the vicinity of 10 CM×10 CM in size in front of a flat or planar light source such as a focusing screen, illuminated from the rear side, comprising; substantially planar frame means having front and rear cover plates of thermoplastic material defining pocket-like compartments arranged longitudinally and transversely therein, said plates being thicker than the film and being spaced apart in the area of said compartments by a distance several times greater than the thickness of the film and providing lateral guide means in said compartments spaced apart laterally by the width of the film and arranged and adapted for insertion and removal of a film therealong, stop means defining an end position for insertion of the film, said front cover plate and said rear cover plate having apertures adapted to the picture size of the film and aligned with each other, said apertures being free of glass and other facing and backing and at least partly arch shaped at their lower edges, said frame means having insert openings which extend on an inclined to the plane of said frame means and lead into said lateral guide means, narrow webs on said front cover plate extending at the sides of said compartments to overlap a small portion of the film and defining the side of said insert opening towards said apertures of said cover plates an inclined face on said frame means defining said insert opening on its upper side, said inclined face commencing from said rear cover plate without a stop or other blocking barrier to a position above the upper edge of a fully inserted film, the distance between the lower stop means and the inner edge of said inclined face being less than the length of the film, measured in the insert direction, by part of the width of the unexposed edge of the film so that said inclined face of the frame portion cooperates with said stop means to bend the upper portion of the film in its fully inserted position at the transition between said inclined face and said rear cover plate to readily retain the lower portion of the film in contact with said stop means, said frame portion which defines the insert opening at its upper side having a recess in it which maintains an edge of the film free and at a distance from said rear cover plate for easy removal of the film from said compartment, and one of said cover plates having a lower recess extending upwards into its aligned aperture for easy movement of the film, which recess is shielded by the other cover plate and extends below the stop means.

4,189,859
DEVICE AT DISPLAY ARRANGEMENT

Stig B. Ahlgren, Malmo, Sweden, assignor to Prisma Neon AB, Malmo, Sweden

Filed Aug. 8, 1977, Ser. No. 822,714
Claims priority, application Sweden, Aug. 9, 1976, 7608882
Int. Cl.[2] G09F 11/02
U.S. Cl. 40—505 4 Claims



1. A display comprising:

a frame;

prisms rotatably mounted in said frame, each of said prisms including adjacent longitudinally extending side surfaces, each set of associated side surfaces of said prisms providing a display when rotated to a side by side position defining a permanently recurring sequence with the number of displays corresponding to the number of side surfaces on each prism;

each prism being provided with a first rotation axle at one end thereof and a second rotation axle at an opposite end thereof;

bearing means disposed on said frame for freely supporting said first and second axles of said prisms;

drive motor means and a transmission for rotating said prisms synchronously, said drive motor means being connected to one of said first rotation axles;

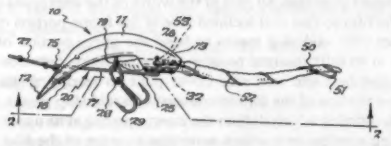
gear discs mounted on said first rotation axles of said prisms; and

belt means mounted on said gear discs for rotating said gear discs and said prisms when said one of said first rotation axles is driven by said drive motor means, said belt means being toothed for meshing with said gear discs.

4,189,860
BAIT CARRIER AND DRIVER

Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Filed May 8, 1978, Ser. No. 903,663
Int. Cl.[2] A01K 85/00
U.S. Cl. 43—42.29 7 Claims



1. A bait carrier comprising;

a body having a driver lip, a floatation portion and a tail portion having a bait cavity;

a spring wire shank member having a laterally disposed anchor bend and pull eye at a first end, a laterally disposed bait keeper at a second end and a finger piece intermediate of the first and second ends;

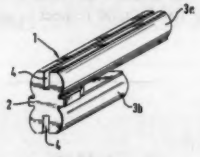
wherein said shank member has said anchor bend and pull eye at its first end firmly imbedded in said body above said driver lip and below said floatation portion, about at the center of oscillation, while said finger piece and said keeper at its second end are free for movement but biased toward said body;

and whereby when said keeper is retracted, a fish bait may be entered into said cavity and retained therein when said keeper is released.

4,189,861
ASSEMBLY KIT AND A CONNECTING ELEMENT FOR CONNECTING STRUCTURAL ELEMENTS THEREOF

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, (Tumlingen), Fed. Rep. of Germany

Filed Jan. 20, 1978, Ser. No. 871,108
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708129
Int. Cl.[2] A63H 33/10
U.S. Cl. 46—26 14 Claims



1. An assembly kit, comprising a first structural element having a face and at least one groove which is open at said face; a second structural element having a wall which has a predetermined thickness and a surface which is positionable onto said face of said first structural element, said second structural element having at least one further groove extending inwardly of said wall; and a substantially U-shaped connecting element having two elongated portions each having two sections which are spaced from one another in a direction of elongation, said elongated portions of said connecting element being connected with one another by an intermediate portion only in the region of their one end sections so that remainder sections of said elongated portions are not connected with one another and spaced from one another to form a gap therebetween which has a transverse dimension substantially equal to the thickness of said wall of said second structural element, one of said elongated portions of said connecting element being insertable into said further groove of said second structural element so that the remainder section of said one portion extends completely inwardly of said wall, the remainder section of the other elongated portion extends completely outwardly of said wall, the wall is received in said gap between said remainder sections of said elongated portions, and said connecting element is firmly clamped on said wall of said second structural element as a result of said dimensioning of said gap, said other elongated portion of said connecting element being insertable into said one groove of said first structural element so as to connect the structural elements with one another.

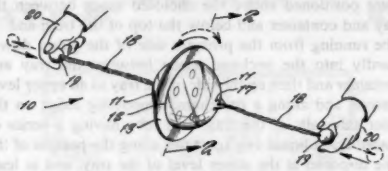
4,189,862
STRING TOP

Ana Lopez, 400 W. 43 St., Apt. 11N, New York, N.Y. 10036

Filed May 5, 1978, Ser. No. 903,090
Int. Cl.[2] A63H 1/28, 27/12
U.S. Cl. 46—63 1 Claim

1. A string top, comprising in combination, a globe held between two sets of strings, said globe being comprised of two, hollow, transparent, hemi-spherical domes with a flat circular

disc therebetween, a plurality of holes through said disc and a plurality of marbles inside said globe so as to freely roll through said holes between said domes; a plurality of openings on diametrically opposite side of said globe, each said set of



strings comprising a plurality of individual strings each one of which is directly attached in one of said openings, said openings at each said side of said globe being a distance apart that is greater than a diameter of a stranded cord formed by said strings when rolled up together.

4,189,863

HOLLOW STRUCTURAL ELEMENT AND AN ASSEMBLY KIT INCLUDING THE SAME

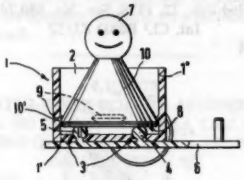
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,413

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 7635178[U]

Int. Cl.² A63H *13/00*

U.S. Cl. 46—116 **10 Claims**



1. A toy assembly kit, comprising a hollow structural element forming a compartment and having a hollow body portion, said hollow body portion having an open end, a wall located opposite to said open end and provided with an opening, and side walls each having a projection; a toy figure insertable into said body portion through said open end and having a lower section adapted to be located inwardly beyond said projections of said body portion and to be engaged by said projections in inserted condition, so that said toy figure is retained in said body portion of said structural element, said lower section of said toy figure having a predetermined height; and another structural element having a connecting projection adapted to pass through said opening of said opposite wall of said body portion and to extend inwardly beyond said opposite wall by a predetermined height, so that said other structural element is connected with said hollow structural element, said projections of said side wall being spaced from said opposite wall of said body portion for a distance substantially equal to said predetermined height of said lower section of said toy figure plus said predetermined height for which said connecting projection of said other structural element extends inwardly beyond said opposite wall, so that said toy figure in the inserted condition abuts against said connecting projection of said other structural element when the latter is connected with said body portion.

4,189,864

SELF-POWERED TOY VEHICLE CHASSIS AND AUTOMATICALLY INTERCHANGEABLE BODIES

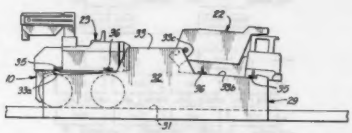
Makoto Saito, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,233

Claims priority, application Japan, Dec. 6, 1976, 51-146803

Int. Cl.² A63H *19/00*

U.S. Cl. 46—202 **3 Claims**



1. A wheeled vehicle toy comprising:

a chassis having a plurality of rollable wheels mounted thereon and at least one vehicle body adapted to be removably received by said chassis, and

vehicle body receiving and dispensing means whereby when said chassis rolls through said receiving and dispensing means with one of said vehicle bodies thereon, said vehicle body will be removed from the chassis without materially impeding the movement of the chassis, and wherein

said vehicle body receiving and dispensing means comprises a vehicle body support having a generally horizontal base portion defining a roadway for said wheeled chassis and a pair of spaced, generally vertical parallel mutually similarly shaped side walls with upper surfaces, at least a portion of each said upper surface thereof being relatively sharply inclined forwardly and upwardly relative to the direction of approach of said chassis to said vehicle body support and said vehicle body including a plurality of projection means extending therefrom and adapted to operatively engage that portion of the upper portion of said side walls defining said incline whereby when said chassis carrying one of said vehicle bodies passes through said vehicle body support, said projection means will engage said inclined portion of the upper surface of said side walls thereby lifting said body off said chassis and into an overhead storage position.

4,189,865

PROCESS FOR GROWING SPROUTS

William F. Stewart, 3814 NW. 122nd St., Vancouver, Wash. 98665, and Charles W. Baldwin, 7805 NE. 27th St., Vancouver, Wash. 98662

Filed Oct. 5, 1978, Ser. No. 948,828

Int. Cl.² A01G *31/02*

U.S. Cl. 47—14 **13 Claims**

1. The method of growing sprouts from seeds comprising:

(a) germinating the seeds into sprouts by submerging them in water until said seeds have germinated;

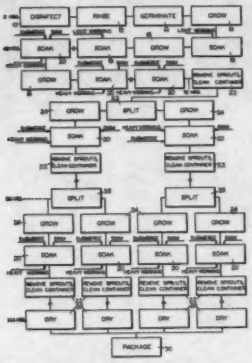
(b) circulating said water continuously so that said water is constantly being replaced by fresh water;

(c) draining the sprouts and thereafter allowing them to stand for a predetermined time interval;

(d) soaking the sprouts in fresh water for a time less than said predetermined time interval;

(e) draining said water from the sprouts and thereafter al-

lowing them to again stand for said predetermined time interval; and



(f) cyclically repeating steps d and e until the sprouts have matured to the desired degree.

4,189,866

POLYMER-OPTICAL BRIGHTENER COMBINATIONS IN TRANSPARENT FILM FORM USEFUL AS GLAZING MATERIALS CAPABLE OF MODIFYING PLANT GROWTH RATE

Michael F. Treadaway, Skelmersdale, England, assignor to The British Petroleum Company Limited, London, England

Filed Jan. 28, 1977, Ser. No. 763,592

Claims priority, application United Kingdom, Jan. 30, 1976, 3741/76

Int. Cl.[2] **B32B** *27/06, 27/18, 27/32;* **C09K** *11/06;* **F21V** *9/16*

U.S. Cl. 47—58 **4 Claims**

1. A process for promoting the growth of plant life which comprises subjecting said plant to visible light transmitted through a polymeric material comprising a polymer selected from the group consisting of polyvinyl chloride, polyethylene and copolymers of ethylene; a hydroperoxide scavenger, and 2,5-di(5-tert-butyl-2-benzoxazolyl) thiophene.

3. A polymeric material transmissive to visible light comprising a polymer substrate selected from the group consisting of polyvinyl chloride, polyethylene and ethylene copolymer and a surface coating thereon comprising 2,5-di-(5-tert-butyl-2-benzoxazolyl) thiophene and a hydroperoxide scavenger.

4,189,867

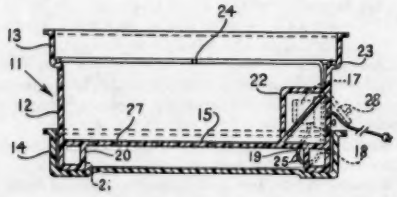
HYDROPONIC UNIT

Stuart Schneck, 766 Teresita Blvd., San Francisco, Calif. 94127

Filed Jan. 18, 1978, Ser. No. 870,477

Int. Cl.[2] **A01G** *31/02, 25/06*

U.S. Cl. 47—62 **8 Claims**



1. A hydroponic unit comprising:

a container for holding nutrient solution;

a tray for holding growing medium, the tray having a perforated bottom and a lower portion shaped to fit securely within the container and to define an enclosed space for nutrient solution between the underside of the tray bottom and the upper surface of the container bottom,

an air pump contained entirely within the tray in a compartment positioned above the enclosed space between the tray and container and below the top of the tray; and

a tube running from the pressure side of the pump downwardly into the enclosed space between the tray and container and then up the side of the tray to an upper level thereof, and along a peripheral supporting ledge on the inner sidewalls of the tray, said tube having a series of spaced-apart liquid exit apertures along the portion of the tube disposed at the upper level of the tray, and at least one liquid entry aperture at the portion which extends into the enclosed space between the tray and container, such that pressurized air flowing through the tube draws nutrient solution into the tube through the liquid entry aperture and dispenses an air-nutrient solution into said growing medium through the liquid exit apertures.

4,189,868

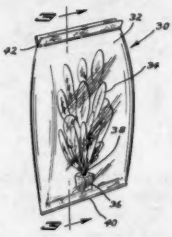
PACKAGE FOR PERISHABLE PRODUCE

Donald L. Tymchuck, Minnetonka; Nelson J. Beall, St. Michael; Noel Davis, Wayzata, and William M. Dreier, Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Feb. 22, 1978, Ser. No. 880,242

Int. Cl.[2] **B65D** *85/52*

U.S. Cl. 47—84 **6 Claims**

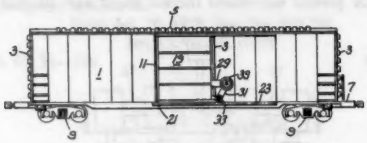


1. In combination, comprising a completely enclosed and sealed bag formed of a flexible, substantially gas impervious plastic film material, said bag having front and back side walls which are spaced relatively far apart intermediate the length thereof and converging downwardly to form a relatively narrow bottom portion and converging upwardly to form a relatively narrow top portion, produce enclosed within said bag and occupying a substantial portion of the bag's interior in a vertical direction, absorbent means within said bag in which said produce has been grown from seed, said absorbent means being positioned within the confines of said relatively narrow bottom portion whereby at least some of any moisture that has collected at said relatively narrow bottom is absorbed by said absorbent means and reused by the produce to compensate for the moisture lost by transpiration and at least an upper portion of said produce being positioned between said upwardly converging side walls, and means for storing and preserving said bag and produce in a refrigerated environment in which a temperature differential is apt to exist on the surface of the bag.

4,189,869
RAILWAY CAR DOOR MOVING MEANS

James J. Hennessy, Chambersburg, Pa., assignor to Hennessy Products, Incorporated, Chambersburg, Pa.

Filed Jul. 26, 1978, Ser. No. 928,300
Int. Cl.[2] E05F *11/54*
U.S. Cl. 49—358 16 Claims

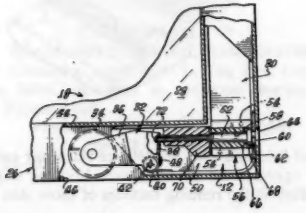


1. Door moving structure for a railway house car having a side wall with a door opening, a door slidable along the wall to close and expose the door opening, an elongated track below the door for movably supporting the door between closed and open positions, a toothed rack mounted on said door track and extending longitudinally thereof, bracket structure mounted on the door adjacent the rear edge thereof and extending rearwardly therefrom with its upper portion at a level substantially higher than said door track, a pinion meshing with said rack and having its shaft journaled on the lower part of said bracket structure and a sprocket on said pinion shaft, a driving sprocket having its shaft journaled on an upper portion of said bracket structure, an endless chain operatively connecting said sprockets and a manually actuable member fixed to said driving sprocket shaft for selective manual rotation of said pinion whereby to effect opening and closing movements of said door, said driving sprocket shaft and manually actuable member thereon being positioned at a level substantially higher than said door track whereby to permit and facilitate operation of said pinion by an operator standing on a surface near the level of said door track.

4,189,870
PATIO DOOR ROLLER ASSEMBLY

B. J. Helmick, 303 Deborah Ct., Upland, Calif. 91786

Filed Oct. 30, 1978, Ser. No. 955,960
Int. Cl.[2] E05D *13/02*
U.S. Cl. 49—420 8 Claims



1. A bottom supporting roller assembly for a sliding door, comprising:

a mounting bracket to be installed along the bottom edge of said door,

a roller bracket pivot on said mounting bracket on a normally horizontal axis for rotation between extended and retracted positions relative to said mounting bracket,

a roller on said roller bracket having its axis parallel to said pivot axis,

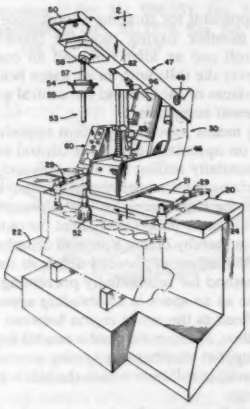
a rotary axially stationary combined lead and lock screw journaled in said mounting bracket with its axis normal to and laterally spaced from said pivot axis and having a tip end engageable in a threaded hole in said roller bracket when the latter bracket occupies its retracted position to releasibly secure said roller bracket in said retracted position, and

a non-rotatable follower member threaded on said screw, whereby rotation of said screw in one direction unthreads said screw from said roller bracket to release said roller bracket for extension and thereafter advances said follower member against said roller bracket to extend said roller bracket.

4,189,871
HONING MACHINE

Donald B. Rottler, Seattle; David Engnell, Issaquah, both of Wash., and Donald B. Rottler, Seattle, assignors to Rottler Boring Bar Co., Kent, Wash.

Filed Jun. 1, 1978, Ser. No. 911,494
Int. Cl.[2] B24B *5/08*
U.S. Cl. 51—34 J 17 Claims



1. In a honing machine of the type having a base assembly, a power head unit mounted for vertical swinging movement on the base assembly, and a honing tool assembly suspended from a universal drive connection with the head unit, the improvement comprising,

double-acting cylinder means pivotally mounted on the base assembly for reciprocating said head unit up and down, and including a piston rod,

first clamping means pivotally mounted on the head unit and operatively associated with said piston rod for selectively clamping the head unit to the piston rod at selected locations therealong to define an upper limit of swing movement of the head unit, said head unit being free to be hand stroked up and down when said first clamping means is not engaged,

a second rod carried by said cylinder means in parallel relation to said piston rod and slidably received by said first clamping,

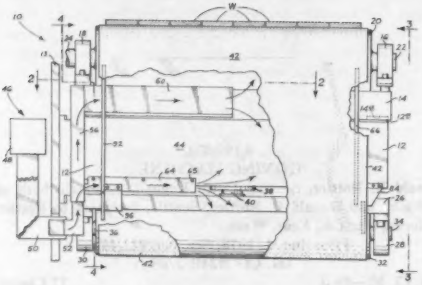
and second clamping means slidably mounted on said second rod below the head unit and adapted to grip the second rod at selected locations therealong, said second clamping means being arranged to be engaged by said first clamping means to define the lower limit of swing movement of the head unit when the head unit is power stroked or manually stroked up and down.

4,189,872

ABRADING APPARATUS AND METHOD HAVING INDUCED AIR

F. David Evans, Eugene, Oreg., assignor to Kimwood Corporation, Cottage Grove, Oreg.

Filed Jun. 5, 1978, Ser. No. 912,365
Int. Cl.[2] B24B *21/00, 1/00*
U.S. Cl. 51—135 R **11 Claims**



1. In apparatus for abrading a workpiece including a central support member having mounted thereon a power-driven contact roll and an idler roll, and an endless, abrasive belt trained over the rolls with an air space being defined between inside surfaces of the belt and the central support member, the improvement comprising:

sealing means provided adjacent opposite ends of each roll and on opposite sides of the central support member for substantially sealing the air space; and

pressurizing means operatively communicating with the air space for maintaining same at a pressure greater than the prevailing air pressure adjacent the outside surfaces of the belt to thereby create a plenum chamber and substantially prevent inflow of abraded debris to the air space.

8. A method for substantially preventing inflow of abraded debris into an air space in an abrading apparatus, the air space being defined as the entire region between the inside surfaces of an endless, abrasive belt and a central support member, the central support member supporting a power-driven contact roll and an idler roll over which the belt is trained, the method comprising:

substantially sealing the air space; and

pressurizing the air space to thereby create a plenum chamber so that the pressure therewithin is greater than the prevailing air pressure adjacent the outside surfaces of the belt.

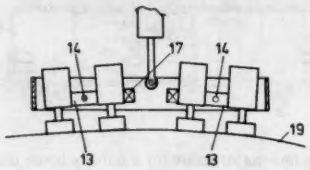
4,189,873

MACHINE FOR TRUING THE BEARING SURFACE OF THE RAILS OF A RAILROAD TRACK

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland and Frank Speno Railroad Ballast Cleaning Co. Inc., East Syracuse, N.Y.

Continuation of Ser. No. 645,472, Dec. 30, 1975, abandoned. This application Nov. 29, 1977, Ser. No. 856,767
Claims priority, application Switzerland, Feb. 25, 1975, 002372/75
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—178 **2 Claims**

1. A machine for truing the bearing surface of a rail of a railroad track, said machine comprising a frame movable over the rail, a train of contact elements coupled to said frame for being driven one behind the other over and along said rail tangentially of said bearing surface with said contact elements in contact with said rail, said contact elements each comprising a grinding means for truing the bearing surface of the rail, support means supporting said contact elements for movement relative to the frame in the direction of said bearing surface to permit said contact elements to reach a predetermined position relative to the rail as the frame moves over the rail, and locking means for locking said contact elements in said predetermined position, said train of contact elements comprising two groups each of two contact elements, a pair of beams and means mounting said groups on said beams, respectively, said support means including pivot means supporting the beams on said frame for pivotal movement thereof about axes located between the contact elements of said groups, said locking means comprising hydraulic cylinder means for locking a respective said beam and the contact elements thereon with respect to said frame, jack means acting on said frame for urging all the contact elements uniformly with greater or lesser force against the rail, said jack means comprising a jack connected to said frame midway between said beams, each contact element comprising an associated drive means coupled therewith.

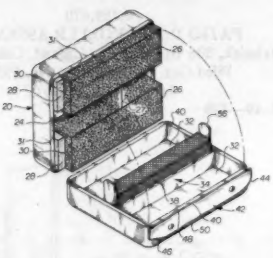


4,189,874

HAND HELD POCKET SIZE SKI REPAIR AND MAINTENANCE TOOL

Daniel J. Labriola, 35 Mt. Olympus Dr. SW., Issaquah, Wash. 98027

Continuation-in-part of Ser. No. 808,190, Jun. 20, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,899
Int. Cl.[2] B21K *17/00*
U.S. Cl. 51—181 R **16 Claims**



1. A hand held and used pocket size ski repair and maintenance tool operated for selected reconditioning steps undertaken to refurbish the running surfaces of snow skis, comprising:

(a) a two piece hollow, hand-held body with surrounding sides transversely separable across a major cross section, the upper hollow piece having a cavity, and the lower hollow piece having a cavity;

(b) cork material as a tool for polishing the bottoms of skis, mounted in the cavity of one of the hollow pieces and sized to leave a space to accommodate other tools and to extend down into a cavity of the other hollow piece;

(c) abrasive stone material for deburring ski edges and removing scratches, mounted adjacent the cork material and sized to be extended a shorter distance down into a cavity of the other hollow piece; and

(d) file means to file both the vertical and horizontal surfaces of ski edges and bottom fitted into the cavity of the other hollow piece and sized to extend alongside the cork mate-

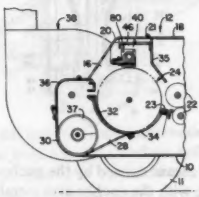
rial and the abrasive stone material positioned in said one hollow piece of said tool.

4,189,875

HARVESTER CUTTERHEAD KNIFE SHARPENING DEVICE

John M. Flenniken, Senonches, France, assignor to Deere & Company, Moline, Ill.

Filed Jul. 10, 1978, Ser. No. 923,266
Int. Cl.² B24B *19/00*
U.S. Cl. 51—250 **9 Claims**



1. In a forage harvester having a cutterhead housing with opposite side walls and a door swingable between open and closed conditions to provide access to the housing interior, a rotary cutterhead mounted in the housing and having a plurality of knives with cutting edges generating a cylinder as the cutterhead rotates, and a knife sharpening mechanism mounted in the cutterhead housing and including an adjustable support structure and a sharpening element mounted on the support structure and shiftable therewith in opposite directions toward and away from the cutterhead periphery and means connected to the support structure for adjusting it in said opposite directions and including a rotatable element rotatable in first and second directions to respectively cause adjustment of the support structure toward and away from the cutterhead periphery, the improvement comprising:

a locking element on the rotary element;

a locking member mounted on the housing and shiftable between a first position wherein it is engageable with the locking element to prevent rotation of the rotatable element in at least the first direction and a second position wherein it clears the locking element;

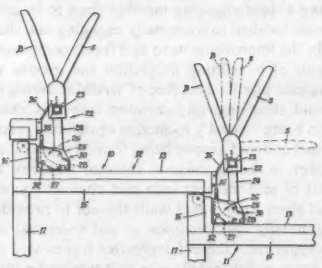
and means operatively connecting the door to the locking member to shift the locking member to its second position only when the door is closed.

4,189,876

BEAM-MOUNTED FOLDING CHAIRS

Philip E. Crossman, and Arthur L. Van Ryn, both of Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Aug. 7, 1978, Ser. No. 931,562
Int. Cl.² E04H *3/12*
U.S. Cl. 52—9 **13 Claims**



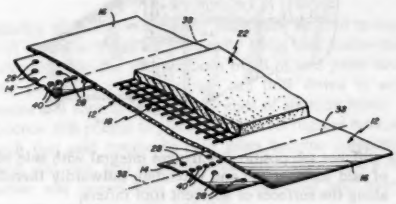
1. In combination with a telescoping row system including a plurality of rows extendable to a use position in which the rows are in stepped relation, and retractable to a storage position in which the rows are generally vertically aligned, said system including seating means and automatic mechanism for raising said seating means to a use position when said rows are extended and for lowering said seating when said rows are retracted, improved seating comprising: frame means adapted for movement between a use and a storage position by said automatic mechanism; at least one chair carried by said frame means and movable therewith, said chair including a seat, a back and hinge means for mounting said seat and said back to said frame means for independent pivotal motion about horizontal axes; resilient means for biasing said seat to a raised position when it is unoccupied while permitting said seat to be lowered for occupancy; and means permitting said back to be pivoted forwardly for closing, said seat and back fitting in the vertical space between rows when said rows are retracted.

4,189,877

EXPANSION JOINT COVER

Arthur P. Jentoft; Joseph P. Anghinetti, both of Kennebunkport, and Paul A. Couture, Emery Mills, all of Me., assignors to York Manufacturing, Inc., Sanford, Me.

Continuation of Ser. No. 708,877, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 584,051, Jun. 5, 1975, abandoned. This application Oct. 30, 1978, Ser. No. 956,083
Int. Cl.² E04B *1/68*
U.S. Cl. 52—58 **6 Claims**



1. An expansion joint cover comprising:

an elongate main strip of a predetermined width;

an elongate strip of insulative material secured to and extending along one surface of the main strip, the insulative strip being of less width than the main strip thereby to define a pair of longitudinally and transversely extending flange portions of the main strip on opposite sides of the insulative strip;

each of the flange portions having an elongate nailing strip embedded therein and extending along the length thereof, and being of a width which is more than one-half that of its respective flange portion, each of the nailing strips having a plurality of nailing holes formed therein; and

each of the nailing strips being formed to define a single, longitudinally extending bend line which is substantially weaker than any other portion of the nailing strip, said bend line being disposed at a predetermined location on the nailing strip, whereby when the nailing strip is bent, it will bend along said bend line, at said predetermined location.

4,189,878

HOUSE ROOF INSULATION VENT

Gerald A. Fitzgerald, 4937 Drew Ave. S., Minneapolis, Minn. 55410

Filed Apr. 15, 1977, Ser. No. 787,897
Int. Cl.² E04B *1/74*; F24F *7/00*
U.S. Cl. 52—95 **4 Claims**

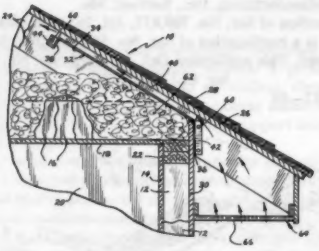
1. A house roof insulation vent for use in a house having an enclosed room partially defined by an outer wall including

vertical outer wall sheathing and a horizontal upper outer wall plate, spaced apart, parallel attic floor joists supported above said outer wall plate, and a room ceiling layer depending from said joists; said house also having spaced apart inclined roof rafters supported above said outer wall plate and extending beyond said outer sheathing, roof boards fastened on upper edges of said rafters, and insulating material covering said ceiling layer to a substantial depth; said insulation vent providing an air passage free of insulating material along and spaced from said roof boards from outside of said sheathing to well above the depth of insulating material; and said insulation vent including:

A. a rectangular roof clearing sheet extending between adjacent roof rafters;

B. roof clearing sheet spacer flanges extending integrally upwardly from said roof clearing sheet into contact with the underside of said roof boards to maintain said roof clearing sheet at a predetermined spaced relationship with respect to said roof boards;

C. a roof clearing sheet stiffener tab integral with an upper end of said roof clearing sheet and extending away from it and away from said roof boards in normal relationship to said roof clearing sheet;



D. stiffener tab positioning flanges integral with side edges of said stiffener tab and extending outwardly therefrom along the surfaces of adjacent roof rafters;

E. means fastening said stiffener tab positioning flanges to said rafters to maintain said tab in fixed relation to said roof clearing sheet; and

F. means at a lower portion of said roof clearing sheet for sealing said roof clearing sheet to said outer wall sheathing to prevent passage of insulating material between said roof clearing sheet and outer house wall, said means including:

(1) an outer wall sheathing contact sheet integral with a lower end of said roof clearing sheet and extending away from it and away from said roof boards,

(2) sheathing contact sheet positioning flanges integral with side edges of said sheathing contact sheet and extending outwardly therefrom along the surfaces of adjacent roof rafters, and

(3) means fastening said sheathing contact sheet positioning flanges to said roof rafters to fixedly position said sheathing contact sheet in sealing relationship with respect to said wall sheathing.

4,189,879

EARTH ANCHOR

Merle W. Patterson, 2635 E. 28th St., Tulsa, Okla. 74114

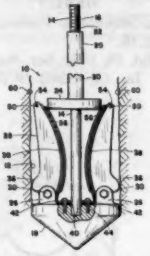
Filed Dec. 5, 1977, Ser. No. 857,781
Int. Cl.[2] E02D 5/74
U.S. Cl. 52—161 7 Claims

1. An earth anchor for securing objects to the earth comprising:

(a) an elongated anchor rod having inner and outer ends;

(b) a plurality of extendable anchor arm members having inner and outer surfaces pivotally carried by the inner end of the anchor rod;

(c) a single flexible skirt member secured to the anchor arms such that when the anchor arms are extended into the earth, the skirt member is spread over the outer surface of the extended anchor arms to provide an enlarged retaining surface; and



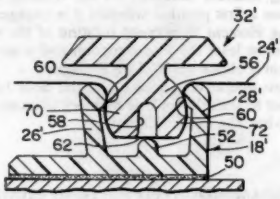
(d) cam follower means carried by the anchor rod and operably engageable with the anchor arm members through the skirt member for extending the anchor arms into the earth.

4,189,880

COMBINATION MOUNTING FRAME AND FILM FOR A WINDOW

Gene Ballin, P.O. Box 403, Locust Valley, N.Y. 11560

Filed Jun. 16, 1978, Ser. No. 915,976
Int. Cl.[2] E06B 3/26
U.S. Cl. 52—202 6 Claims



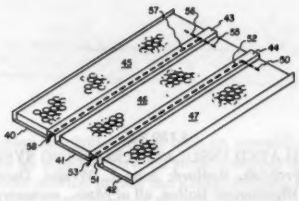
1. Improvements for a frame attached about a window for holding a plastic sheet in a taut condition in covering relation over said window of the type employing mounting strip means in surrounding relation to said window consisting of spaced apart walls bounding a sheet-engaging channel therebetween and having a sheet-engaging member sized to be inserted into said channel incident to frictionally engaging said sheet against said walls, the improvements to said frame comprising a cooperating pair of interfitting projection and groove means for stretching said plastic sheet free of wrinkles during said insertion of said sheet-engaging member into said channel, said projection being centrally located in upstanding relation along said channel and said groove being formed in said sheet-engaging member in facing relation thereto, whereby the initial movement of said member into said channel frictionally engages said sheet against said walls thereof to provide a corresponding initially taut condition in said sheet and subsequent insertion movement thereof thereafter forces said projection into said groove with said sheet in an interposed position therebetween to cause the further stretching out of any wrinkles in said sheet.

4,189,881

PHOTOVOLTAIC ROOF CONSTRUCTION

Wilbur W. Hawley, Danville, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 12, 1979, Ser. No. 19,960
Int. Cl.[2] E04D 12/00; H01L 31/04
U.S. Cl. 52—220 4 Claims



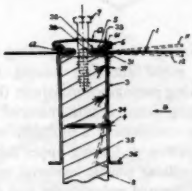
1. In a batten-seam and pan roof construction, the improvement comprising at least one photovoltaic cell module carried by said roof, and at least one electrical conduit means connected to said at least one photovoltaic module, said electrical conduit means being disposed primarily under the battens of said roof.

4,189,882

TRANSLUCENT ROOFING MEANS

Henry Harrison, and Henry C. Harrison, both of Locust Valley, N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,611
Int. Cl.[2] E04B 1/00; E04C 1/34; E04D 1/36
U.S. Cl. 52—222 5 Claims



1. Roofing means comprising a panel capable of withstanding tension loads, means for securing the panel onto a frame comprising an elastic tensioned clamping member joining said panel in tensioned relation to said frame and a deformable elastic sealing member secured between said clamping member and said panel, said elastic clamping member comprises a clamping member having a channel adapted to receive the edge of said panel and a spline which can be jammed into said channel together with said panel edge to hold said panel edge in firm frictional clamped relation with said clamping member.

4,189,883

COMPOSITE SYSTEM FOR FLOOR FRAME MEMBERS

Ira J. McManus, 39 Lincoln Ave., Florham Park, N.J. 07940

Filed Aug. 4, 1978, Ser. No. 930,950
Int. Cl.[2] E04B 1/16
U.S. Cl. 52—250 4 Claims

1. An improved composite steel and concrete slab system for floor framing members comprising:

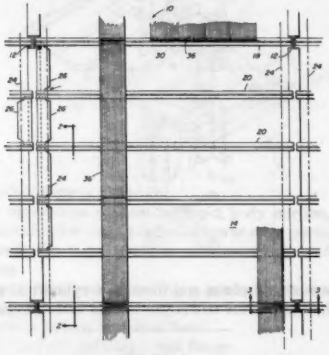
a plurality of spaced apart, weight bearing vertical columns;

a plurality of spaced apart, weight bearing horizontally oriented beams extending longitudinally between said columns;

a plurality of spaced apart, weight bearing composite-type joists extending transversely between said columns and secured thereto;

a plurality of intermediate, spaced apart, weight bearing non-composite-type joists extending transversely between said beams and secured thereto;

unpunched corrugated decking extending longitudinally from one composite-type joist to the next composite-type joist and extending laterally from one beam to the adjacent beam; thus covering an area defined by four columns at its perimeter;



a plurality of downward sloping beam pans secured to support rods positioned longitudinally along said beams and extending into the end positions of all of said joists such that poured in place concrete can flow down to said beams and haunch between the ends of abutting joists;

a concrete slab poured in place over said corrugated decking such that said composite-type joists become composite with said slab, said non-composite type joists have composite end connections with said slab, and said beams become composite with said slab.

4,189,884

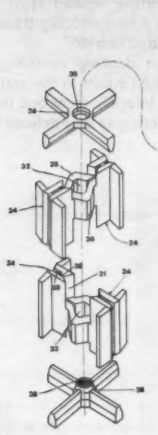
COMPLEX STRUCTURE OBTAINED FROM THE UTILIZATION OF PARTICULAR CLAMPS

Irmo Pecoraro, Via Palazzi, 2, Milano, Italy

Filed Oct. 28, 1977, Ser. No. 846,559
Int. Cl.[2] E04B 2/72
U.S. Cl. 52—285 4 Claims

1. A three way or four way clamp adapted to carry out the assembly of at least two panels which comprises four members, each member being formed substantially by two rectangular plates which are parallel and connected by a dihedral structure, the said plates having inclined edges and being coupled in pairs, said plates being provided with a continuous relief, said clamp being intended for use with spiders by means of a screw, wherein the said dihedral structure is off-center relative to the transversal axis of the plates, so that said pairs fit into each other according to a mutually orthogonal arrangement, said dihedral structures delimiting a through-hole, said screw fitting into said through-hole, said screw connecting said spiders, wherein the said spiders show a central core of frustoconical

shape and are provided with arms having a substantially trapezoidal section, said spiders pressing on the inclined edges of the



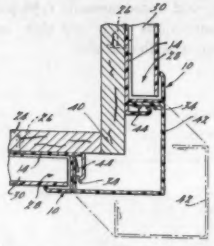
two pairs of said plates and forming a cylindrical seat to receive the head of the said screw and an inner threading.

4,189,885

CHANNEL MEMBER FOR SIDING CONSTRUCTION

Jack E. Fritz, Walled Lake, Mich., assignor to Wolverine Aluminum Corporation, Lincoln Park, Mich.

Filed Aug. 29, 1978, Ser. No. 937,878
Int. Cl.² E04F *13/06*
U.S. Cl. 52—287 **13 Claims**



1. An elongated trim strip for siding construction on a structure, said trim strip having a first channel adapted to retain a relatively thick edge portion of one siding element and a second channel adapted to retain a relatively thin edge portion of another siding element, said trim strip comprising:

a rear panel adapted to be secured to said structure;

a first transverse panel integral with said rear panel and extending outwardly therefrom;

a front panel integral with said first transverse panel and extending generally parallel to said rear panel, said front panel cooperating with said first transverse panel and the portion of said rear panel adjacent to said first transverse panel to form said first channel;

a second transverse panel integral with said rear panel and extending outwardly therefrom, said second transverse panel being positioned on the same side of said rear panel as said first transverse panel, said second transverse panel extending generally parallel to, but a shorter distance than, said first transverse panel and being positioned on the other side of said first transverse panel from said front panel, said second transverse panel cooperating with said first transverse panel and the portion of said rear panel extending between said first transverse panel and said second transverse panel to form said second channel;

means for retaining a relatively thick edge portion of one siding element associated with said first channel; and

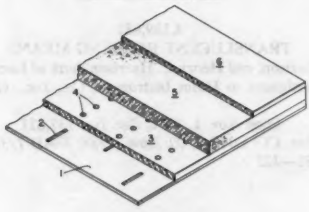
means for retaining a relatively thin edge portion of another siding element associated with said second channel.

4,189,886

VENTILATED INSULATED ROOFING SYSTEM

Robert T. Frohlich, Bedford; John L. Wright, Duxbury, and Bruce A. Blessington, Bolton, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 484,818, Jul. 1, 1974, abandoned, which is a division of Ser. No. 409,849, Oct. 26, 1973, Pat. No. 3,884,009. This application Feb. 13, 1976, Ser. No. 658,145
Int. Cl.² E04B *1/16, 1/20*
U.S. Cl. 52—302 **1 Claim**



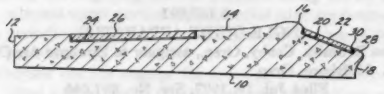
1. A ventilated, insulated roof comprising (a) a subdeck of substantially rigid metal sheeting having apertures therethrough for permitting passage of moisture; (b) a first layer of fluid moisture-bearing construction material over the metal subdeck; (c) a layer comprising a plurality of normally low-permeance insulation boards having upper and lower surfaces and comprised of cellular plastic material selected from the group consisting of foamed polystyrene and foamed polyurethane, said boards further having a plurality of openings therethrough, each said opening extending vertically from said upper surface through the body of said board to said lower surface so that each opening is surrounded by said cellular plastic material, all of said openings being dimensioned sufficiently to pass moisture therethrough, certain of said openings having a widthwise dimension of up to about 0.37 inch in order to prevent fluid, moisture-bearing construction material poured thereon at the job site from entering and substantially filling such openings, other of said openings being from about 1.5 to about 3 inches in a crosswise dimension in order that said construction material will flow into and substantially fill them and thus provide bridges of said construction material to be formed through said board; (d) a second layer of said fluid construction material extending over and in contact with the said upper surfaces of said boards, said second layer of fluid material extending into and substantially filling said openings having a crosswise dimension of from about 1.5 to about 3 inches but not substantially extending into the said openings having a widthwise dimension of up to about 0.37 inch; and (e) a surface layer of waterproofing material above said second layer of construction material, whereby moisture from said second layer of construction material can be directly vented through the vacant openings maintained in said boards, through said first layer of construction material and out said apertures in said metal sheeting.

4,189,887

COPING WITH INLAID TILE

James J. Gallant, 4655 Briercrest Ave., Lakewood, Calif. 90713, and Clarence T. Childress, Whittier, Calif. 90606

Filed May 15, 1978, Ser. No. 905,758
Int. Cl.² E04C 2/30
U.S. Cl. 52—311 5 Claims



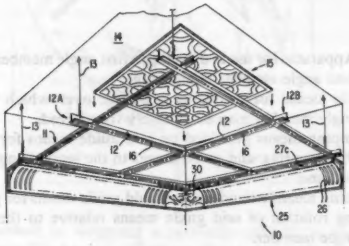
1. A coping specially formed with an upwardly rising top surface and an adjacent forward surface sloping downwardly opposite from said top surface and a ridge defining the juncture between said top and forward surfaces, and inset areas in said top and forward surfaces for mating inlaid tile.

4,189,888

DECORATIVE CEILING SYSTEM

Jacob H. Blitzer, Jr., 2231 Colby Ave., Los Angeles, Calif. 90064

Filed Mar. 2, 1978, Ser. No. 882,560
Int. Cl.² E04B 5/52
U.S. Cl. 52—484 9 Claims



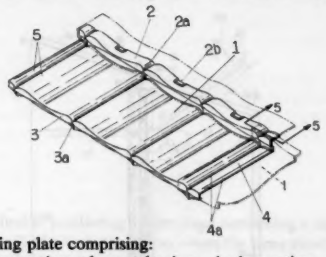
1. A decorative ceiling system comprising:
an inverted T-bar grid suspendable from an overhead structure, each T-bar in said grid having a vertical web and a horizontal flange;
a decorative plastic facing strip bonded to the bottom face of each inverted T-bar flange, said facing strip having repetitive design elements relief molded therein, and
a plurality of like panels supported by said grid, each panel having:
like one of a plurality of different three dimensional decorative relief patterns of symmetric design molded therein, and
a peripheral shoulder recessed from the immediately adjacent panel design surface, said shoulder having a uniform width generally corresponding to the extent of projection of said T-bar flange to one side of said web,
each of said plurality of different panel symmetric designs having relief pattern elements which align with the relief molded repetitive design elements of said facing strip, so that said panels and said facing strips together give the appearance of a continuous geometric and symmetric pattern visually uninterrupted by T-bars.

4,189,889

SHAPED METALLIC ROOFING PLATE

Tomoo Yanoh, 3-1-7, Eifuku, Suginami-ku, Tokyo, Japan

Filed Mar. 16, 1978, Ser. No. 887,177
Int. Cl.² E04D 1/34, 1/36
U.S. Cl. 52—530 4 Claims



1. A roofing plate comprising:
a water impervious element having a body portion, and a connected upper edge portion, a lower edge portion, and opposed side edge portions circumscribing said body portion,
said upper edge portion having a generally upwardly extending portion terminating in a forwardly extending projection having a reverse bend,
said reverse bend defining a nail flange,
said lower edge portion including a longitudinally extending depending flange having a complementary extending projection for complementing the forwardly extending projection of the upper edge portion of a like adjacent roofing plate,
and the respective opposed side edges of said plate include a transversely extended groove extending parallel to its respective side edge whereby said opposed side edge portion complements one another so that in the assembled position of like roofing plates, the groove formed adjacent one edge portion of one plate overlies the groove formed adjacent the other end portion of a like roofing plate in spaced relationship to define flow channel therebetween to prohibit any capilliary action from occurring between overlying side edge portions of adjacent roofing plates,
wherein said nailing flange is located at an elevation above said surface of the body portion.

4,189,890

PANEL JOINT

Gurdip S. Bains, and Niles J. Martin, both of Bonneauville Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

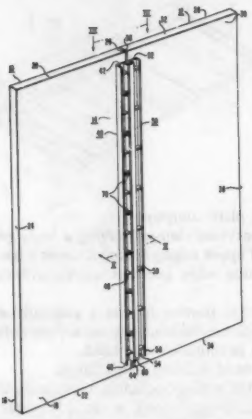
Filed Aug. 8, 1978, Ser. No. 931,647
Int. Cl.² E04C 1/18
U.S. Cl. 52—584 4 Claims

1. A panel joint, comprising:
first and second adjoining, upstanding wall panels having front and rear surfaces and adjacent edges which are to be joined together with the front surfaces of the panels in a common plane,
first and second rigid metallic joint elements, said first and second joint elements each having web portions fixed to the rear surfaces of said first and second wall panels, respectively, adjacent to said adjacent edges,
said first joint element including an integral first leg portion perpendicular to its web portion and to the rear surface of said first wall panel, which extends along the edge of the first wall panel which adjoins an edge of the second wall panel,
said second joint element including an integral first leg portion perpendicular to its web portion and to the rear surface of said second wall panel, which leg portion is in

spaced parallel relation with the first leg portion of said first joint element,

one of said first leg portions having an integral flanged end perpendicular thereto which extends towards and bridges the space between the other first leg portion, with the outermost edge of said flange contacting the facing side of the other first leg portion,

said first leg portions having a plurality of aligned openings located between the flanged end and said web portions,



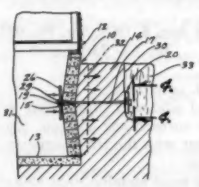
and clamping means including bolts disposed through the aligned openings in the spaced first leg portions of the first and second joint elements, and nuts tightened on said bolts to simultaneously force said flanged end against the facing surface of the leg portion, and to force at least a portion of the adjacent edges of said first and second wall panel members tightly together.

4,189,891

METHOD FOR ANCHORING AND STRAIGHTENING WALLS

Michael K. Johnson, Des Moines; Clarence E. Johnson, Winterset; Raymond E. Parker, Winterset, and John V. Wright, Winterset, all of Iowa, assignors to Grip Tite Mfg. Co., Winterset, Iowa

Filed Apr. 13, 1978, Ser. No. 895,944
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—742 **5 Claims**



1. A method for anchoring and straightening a wall which extends below the ground comprising the steps of:

forming a hole in the ground at a distance from said wall;

forming an opening in said wall from one side of the wall at a level below the ground, said opening being substantially aligned with the hole in the ground;

forcing an elongated member through the opening in the wall and through the ground to a position in which one end of said member extends into said hole in the ground and the other end extends on said one side of the wall;

securing an anchoring means to said one end of the member;

attaching a wall plate to the other end of the elongated member; and

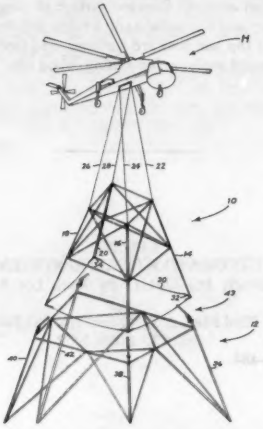
forcing the wall plate towards the wall along said shaft whereby the wall plate is forced against said wall and the wall is thereby moved towards being straightened.

4,189,892

ANGLE GUIDE APPARATUS

Harlan B. Smith, Canby, Oreg., assignor to Erickson Air Crane Co., Hillsboro, Oreg.

Filed Jul. 19, 1977, Ser. No. 817,046
Int. Cl.[2] E04H *12/34*
U.S. Cl. 52—749 **14 Claims**



1. Apparatus for use in directing a first angle member toward a second angle member comprising:

guide means for providing a surface over which the first angle member may be slideably transferred;

clamping means provided on said guide means for detachably securing said guide means to the second angle member; and

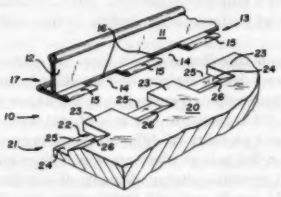
bracing means extending from said guide means for preventing rotation of said guide means relative to the second angle member.

4,189,893

CEILING RUNNER AND PANEL ASSEMBLY HAVING SLIDING LOCKABILITY

Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Sep. 11, 1978, Ser. No. 941,494
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—779 **18 Claims**



1. A suspended ceiling system comprising:

vertically adjustable hanger brackets depending from upper

support structures and rigidly supporting inverted-T runners;

said inverted-T runners being in parallel relationship and having web portions terminating in lower arm flanges wherein at least one of the arm flanges has notches at periodic intervals thereby providing remaining tab portions;

ceiling tile engaging the tab portions along kerfed edges wherein upper portions of the kerfed edge are removed at periodic intervals corresponding to the spacing of the tab portions;

whereby the tile engage the inverted-T runners by being lifted and shifted to slidably lock the tab portions within the kerfed edges of the tile; and,

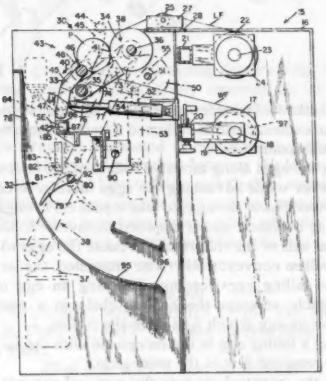
whereby the ceiling is levelled by means of vertically adjustable hanger brackets.

4,189,894

METHOD OF AND APPARATUS FOR WRAPPING PRODUCTS

Robert Laing, Sutton, Mass., assignor to Curtis & Marble Machine Company, Worcester, Mass.

Filed Aug. 28, 1978, Ser. No. 937,055
Int. Cl.² B65B *11/04*
U.S. Cl. 53—399 **32 Claims**



30. Method of wrapping a generally cylindrical product with plastic film having sufficient softness and frictional characteristics for enabling the film to adhere to the surface of the product upon contact therewith, comprising the following steps:

(a) extending a free end of the film from a supply of film over a supporting means to a cut-off line spaced from the supporting means,

(b) placing the cylindrical product against the film on the supporting means,

(c) transferring the free end of the film against the product so that it adheres to the product,

(d) rotating the product on the supporting means about its central longitudinal axis in one direction to wrap the wrapping film around the product,

(e) rolling the product toward said cut-off line to a point beyond the cut-off line so that the product rotates about its central longitudinal axis in the direction opposite from said one direction, thereby partially unwrapping the film from the product so that it extends across the cut-off line,

(f) cutting the film along the cut-off line, and

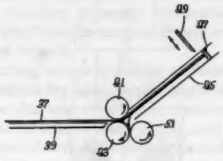
(g) rotating the product in said one direction to wrap the portion of the film which extends from the product to the cut-off line onto the product.

4,189,895

METHOD AND APPARATUS FOR MAKING ENVELOPE ASSEMBLIES

John K. Volkert, Northfield, and Robert B. Volkert, Wilmette, both of Ill., assignors to Compak Systems, Inc., Northfield, Ill.

Filed Dec. 16, 1977, Ser. No. 861,289
Int. Cl.² B65B *63/04, 11/48*
U.S. Cl. 53—429 **12 Claims**



1. A method of producing an envelope containing a separate enclosure both of which are formed from the same sheet material, said method comprising

providing sheet material having first and second portions with said second portion being narrower than said first portion,

folding said sheet material so that said second portion and said first portion are superimposed one upon the other without making any adhesive interconnections therebetween and moving said sheet material with said fold being formed at the leading edge of said sheet material,

maintaining said first and second portions in substantially continuous motion from the time of said folding and then changing their direction of movement at least once,

at a moment when said portions change their direction of movement separating said second portion from said first portion by severing said sheet material along the leading edge which is common to said first and second portions while maintaining said portions in said superimposed relationship without any adhesive interconnections therebetween and

at said moment beginning folding said first portion about said separated second portion to envelop same while continuing to maintain said portions in said superimposed relationship and completing the folding and forming of the envelope by joining the folded wider regions of said first portion in surface contact with each other.

4,189,896

LIQUID IMPREGNATING SYSTEM

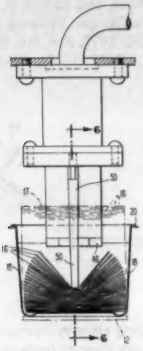
Charles G. Kolbach, Media, Pa.; Edward M. Niedziejko, Wilmington, Del., and Joseph P. Rizzo, Lester, Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 25, 1978, Ser. No. 936,863
Int. Cl.² B65B *3/00, 1/20*
U.S. Cl. 53—431 **17 Claims**

1. A method of introducing a liquid into absorbent sheets that are maintained in a stacked condition with at least a portion of the stack positioned within the interior of a container, said method including the steps of:

(a) applying a compressive force to only a limited region of the upper sheet of the stack in a manner to both reduce the height of said stack and reduce the intimacy of contact

between sections of at least some adjacent sheets of said stack; and



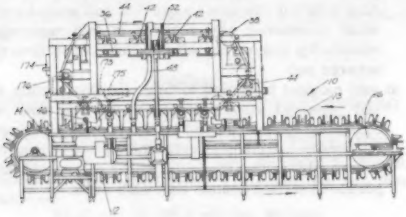
(b) directing a liquid into engagement with the sheets while maintaining said compressive force.

4,189,897

HIGH SPEED EVACUATION CHAMBER PACKAGING AND CLIPPING MACHINE

Harrison A. Ailey, Jr., Knoxville, Tenn.; L. George Andre, Cincinnati, Ohio, and Roman M. Tomczak, Raleigh, N.C., assignors to Acraloc Corporation and Rheem Manufacturing Company, both of Oak Ridge, Tenn.

Filed Nov. 1, 1978, Ser. No. 957,193
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—434 **27 Claims**



27. A method for high speed evacuation, clipping and trimming of bagged product, continuously and in rapid succession, which comprises the steps of:

(a) providing a first endless conveyor carrying a plurality of bagged product carrying platens, said first conveyor conducting said platens along a horizontal path of travel with said platens facing upwardly;

(b) providing a second conveyor carrying a plurality of hoods, said second conveyor conducting said hoods between and along upper and lower paths of travel;

(c) locating said second conveyor with respect to said first conveyor such that when each hood is shifted from its upper path of travel to its lower path of travel it will engage one of said platens traveling in its horizontal path of travel to form a chamber therewith;

(d) evacuating each said chamber;

(e) applying a clip to said bag in each said chamber to close said bag about said product;

(f) trimming the excess of each said bag in each said chamber following the clipping of said bag;

(g) devacuating each said chamber after said bag has been clipped and trimmed; and

(h) shifting said hoods from said lower path of travel to said upper path of travel so that they disengage from their respective platen, exposing said clipped and trimmed bagged product on said platen for further processing;

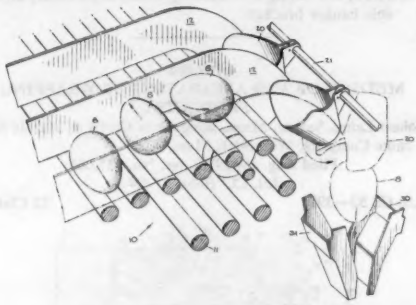
whereby said packaged products can be evacuated, clipped and trimmed continuously and in rapid succession.

4,189,898

EGG PACKER

Frank G. Moulds, Livonia, and Michael A. McCord, Wayne, both of Mich., assignors to Diamond International Corporation, New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,462
Int. Cl.[2] B65B *35/56*
U.S. Cl. 53—446 **12 Claims**



10. A method of transferring eggs from a conveyor which includes an endless chain of rollers to a transportable receiving means which comprises

rotating the eggs along movable rollers of the endless chain conveyor while advancing the eggs thereon to cause the narrower end of the eggs to take a position in engagement with an abutment means disposed transverse to the longitudinal axis of the rollers and to cause the eggs to roll off the endless conveyor otherwise unassisted, the larger end of the falling eggs leading, disposing an egg catching receptacle adjacent the endless chain in a position to receive an egg which falls from the rollers,

receiving a falling egg in the receptacle with the larger end being received first in the receptacle,

rotating the receptacle to turn the received egg into a position with its narrow end oriented in a downward direction, and transferring the egg from the receptacle with its narrow end downwardly facing into a transportable receiving means.

4,189,899

APPARATUS FOR DE-AERATING AND VACUUMING PACKING WITH TIGHT CLOSING ANTI-POLLUTION DEVICE

Jean-Pierre Merat, 135 Avenue Gabriel Peri, Le Perreux, and Gaston Wiel, 60 Bd. Emik Augier, Paris, both of France

Filed Mar. 15, 1978, Ser. No. 873,439
Claims priority, application France, Jan. 6, 1978, 78 00283
Int. Cl.[2] B65B *43/26*
U.S. Cl. 53—570 **9 Claims**

1. Apparatus for filling a bag with a flowable material including:

a spout including a flexible portion adapted to be coupled with a source of said material;

a pair of opposed, shiftable hinge plates respectively abutting opposite sides of said spout and having the opposite extremeties thereof connected with each other by hinges to allow shifting of said plates toward and away from each other whereby to distort said flexible spout portion and control the flow of said material through said spout por-

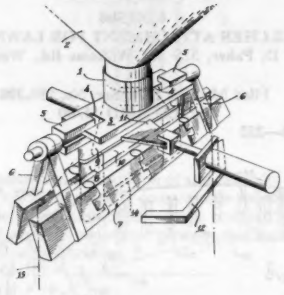
tion, said hinge plates being adapted to have said bag sleeved therearound;

means operably coupled with said hinge plates for selectively shifting the latter toward and away from each other;

a horizontal support disposed above said hinge plates;

a pair of slide members respectively mounted for sliding movement on opposite extremeties of said horizontal support;

a pair of sliding supports respectively mounted on said slide members for sliding movement along with the latter;



a pair of grip members extending downwardly from said sliding supports and shiftably mounted on each of the latter for shifting movement toward and away from each other; and

flexible structure connected to corresponding ones of said grip members and extending between the latter on opposite sides of said hinge plates, said flexible structure being shiftable into engagement with said bag upon shifting of said grip members toward each other whereby to releasably hold said bag against said hinge plates.

4,189,900

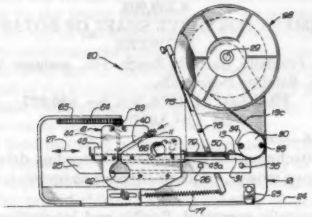
APPARATUS AND METHOD TO TWIST TIE ARTICLES

Leland H. Platt, Jr., 5637 "C" Lake Murray Blvd., La Mesa, Calif. 92041

Filed Jun. 9, 1978, Ser. No. 914,057

Int. Cl.[2] B65B *57/08*

U.S. Cl. 53—583 **15 Claims**



1. In apparatus for securing a section of a tie band about a localized wall of an article, the band being foldable, the combination comprising

(a) means for extending the band in a lengthwise feed direction,

(b) guide means for guiding the wall into position across a section of the extended band,

(c) means for effecting folding of said section of the band partially around the wall to provide two section arms relatively folded toward one another,

(d) means including a carrier to effect relative travel of the wall and folded arms in a travel direction, and

(e) means for twisting said folded arms during said relative travel to produce a tie about said wall,

(f) said fold effecting means defining a first zone located on the carrier in a direction of axial alignment with said twisting means to receive the wall after it has arrived at said position across said section of the extended band,

(g) said carrier including an elongated slide on which said fold effecting means is located, said slide having a top surface along which the unfolded band section initially extends, said top surface extending generally horizontally to define a plane below which said zone extends and above which said twisting means extends,

(h) the fold effecting means including surfaces at the sides of said zone to deflect the band section displaced into said zone by said wall so that said arms are simultaneously folded into positions adjacent said twisting means, said zone remaining in said direction of axial alignment with said twisting means and said surfaces extending in said direction.

4,189,901

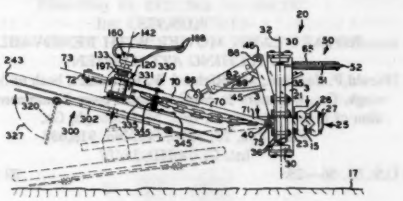
FLAIL SHREDDER

Anton J. Poettgen, 994 Cypress, Wasco, Calif. 93280

Filed May 18, 1978, Ser. No. 907,099

Int. Cl.[2] A01D *50/00*

U.S. Cl. 56—10.4 **5 Claims**



1. A flail shredder comprising:

A. a drive shaft;

B. means mounting the drive shaft for rotation about an upwardly extended longitudinal axis;

C. means mounting the drive shaft for earth traversing movement along a line of travel transversely of the axis;

D. means mounting the drive shaft for adjustable movement transversely of the line of travel;

E. a flail assembly mounted on the lower end of the shaft;

F. drive means connected to the shaft;

G. a stop limiting adjustable movement of the shaft transversely of the line of travel in one direction;

H. means resiliently urging the shaft toward the stop;

I. a bearing mounted on the shaft above the flail assembly;

J. a circular guide wheel mounted concentrically on the bearing for rotation independently of the shaft and the flail assembly disposed for rolling engagement with obstructions to urge the shaft and the flail assembly away from the stop to pass about such obstructions; and

K. adjustable brake means for frictionally engaging the guide wheel and limiting the rotational speed thereof relative to the shaft.

4,189,902

MOWER-CONDITIONER

Pierre Kaetzel, Saverne, France, assignor to Samibem, S.A., Marmoutier, France

Filed Feb. 2, 1978, Ser. No. 874,641

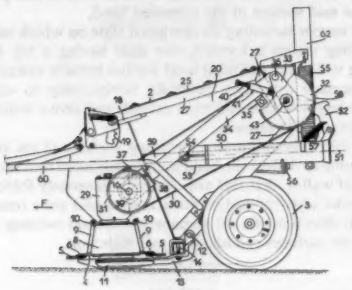
Claims priority, application France, Sep. 8, 1977, 77 27955

Int. Cl.[2] A01D *35/264*

U.S. Cl. 56—15.6 **5 Claims**

1. A mower-conditioner comprising a cutting mechanism and a conditioning mechanism having a conditioning passage having lateral walls, the said machine being hitched laterally beside a tractor, and comprising a post connected on one end

to a double-output control box fixed to one of the lateral walls of the conditioning passage and on the other end to the bearing of an input pulley, and a tube permitting the machine to oscillate about an axis oriented substantially according to the direc-



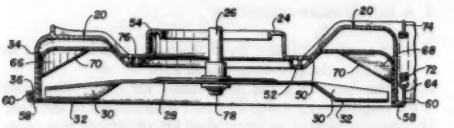
tion of travel of the machine, the said tube constituting its device for hitching in the working position, and the afore-mentioned post extending parallel with the wall of the conditioning passage nearer to the tractor.

4,189,903

ROTARY LAWN MOWER WITH REMOVABLE MULCHING ATTACHMENT

Harold P. Jackson, and Richard W. Rhinehart, both of McDonough, Ga., assignors to McDonough Power Equipment, Division of Fuqua Industries, Inc., McDonough, Ga.

Filed Jun. 23, 1978, Ser. No. 918,608
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—255 **28 Claims**



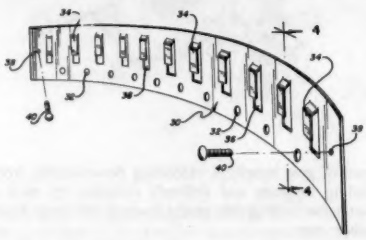
1. A rotary lawn mower comprising,
a housing including a top wall and a downwardly depending sidewall, and having a discharge chute opening formed in its peripheral portion,
wheel means supporting the housing for movement over a support surface,
a rotary blade supported for rotation in a plane generally parallel to the supporting surface and spaced below the top wall of the housing, the rotary blade including an airfoil portion for creating a flow of air upwardly and around the inner peripheral portion of the housing from beneath the plane of the blade for lifting the grass to be cut and for conveying the clippings around the housing and outwardly through the discharge chute opening,
drive means for driving said rotary blade,
an annular mulching liner mounted within the housing, said mulching liner including an upwardly extending, substantially circular skirt portion extending in contiguous relation with the inner surface of said sidewall within said housing throughout at least a substantial portion of its circumference, and a top panel extending inwardly from the top of said skirt beneath said top wall and above the path of said rotary blade, said top panel having a central opening extending therethrough,
said drive means including a generally vertical shaft extending downwardly through said housing and said central opening and supporting said rotary blade for rotation in said plane, and
attaching means for releasably retaining said mulching liner within said housing with said liner extending over and effectively blocking said discharge chute opening to permit operating the mower as a mulching mower,
said attaching means being releasable to permit removal of said mulching liner to enable lawn clippings to be discharged through said chute opening,
and wherein said multing liner has guide means for directing clippings inwardly toward said central opening.

4,189,904

LEAF MULCHER ATTACHMENT FOR LAWN MOWERS

Alexander D. Paker, 3 S 335 Williams Rd., Warrenville, Ill. 60555

Filed May 27, 1976, Ser. No. 690,398
Int. Cl.[2] A01D *75/00*
U.S. Cl. 56—255 **6 Claims**



6. A leaf mulching attachment for use with a rotary lawn mower having a housing, a rotating grass cutting blade located within the housing and a grass ejection chute opening defined by the housing, the improvement comprising: a plate adapted for connection to the interior of said housing, said plate having a size that is sufficient to cover a substantial portion of said chute opening; a plurality of tines extending inwardly and downwardly from said plate; said plate defining a plurality of openings; and means for connecting said plate to said housing whereby said plate and tines avoid contact with said grass cutting blade; said tines being struck from said plate and overlying a portion of the openings from which said tines are struck.

4,189,905

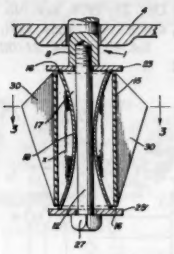
ATTACHMENT FOR DRIVE SHAFT OF ROTARY LAWN MOWERS

Alfred A. Frantello, Satellite Beach, Fla., assignor to Corinth Co. Inc., Satellite Beach, Fla.

Filed Feb. 24, 1978, Ser. No. 880,987
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 **5 Claims**

1. An attachment for the vertically-extending drive shaft of a rotary lawn mower, edger or trimmer comprising, in combination
(a) a centrally apertured, flexible and longitudinally compressible spool;
(b) a rigid cylindrical housing of shorter length for said spool;
(c) upper and lower centrally apertured washers for contacting the corresponding ends of said spool and said rigid cylindrical housing;
(d) an elongated centrally disposed adjustable bolt extending through said spool, housing and washers and adapted for screw-threaded reception in a screw threaded recess in the lower end of the drive shaft; and
(e) a heavy-duty filament-type cutting strand wrapped

around the spool so as to provide at least two free-travelling ends which extend outwardly through relatively short radially disposed tubes which are mounted on the periphery of said rigid cylindrical housing and in evenly spaced alignment with communicating apertures in the sidewall of said rigid cylindrical housing;



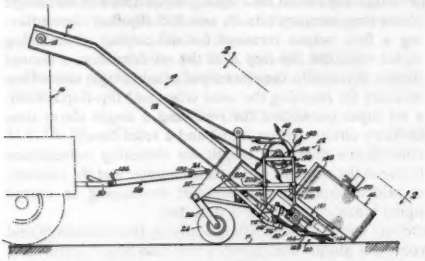
(f) the diameter and composition of said centrally apertured, flexible and longitudinally compressible spool being such as to permit the adjustment of said bolt and washers to preclude rotative movement between said spool and said rigid cylindrical housing.

4,189,906

TOMATO HARVESTER ATTACHMENT

George H. Cooper, 13841 SW. 252nd St., Princeton, Fla. 33032

Filed Jun. 12, 1978, Ser. No. 914,609
Int. Cl.[2] A01D 46/00
U.S. Cl. 56—327 R 10 Claims



1. A cutter and tomato vine feed device in combination, for attachment to the lower forward end of an existing driven conveyor for use in harvesting tomatoes in fields where it is desirable to cut the tomato vines from their root systems above the ground level and to feed the cut vines onto the lower forward end of the conveyor for rearward upward movement into the main body portion of the existing tomato harvester device, the cutter and feed device comprising:

a cutter head including a first cutter member provided with a first plurality of teeth extending forwardly of a central portion of a forward end of the conveyor, a second cutter member provided with a second plurality of teeth in generally aligned contact with said first teeth and means to oscillate said second member relative to said first member to provide a shearing action between said first and second teeth,

means to pivotally attach said cutter head beneath the forward end portion of the conveyor, substantially rearwardly of said first and second teeth, to provide for vertical pivotal movement thereof,

follower means fixed to said cutter head intermediate said pivotal attachment and teeth, and between said head and the surface of the ground to impart vertical pivotal movement to said head in direct response to vertical variations in the ground level, when the harvester is in operation, to maintain said teeth above ground level at all times;

rotary vine engaging means comprised of a pair of relatively large rotary members of predetermined diameters, rotatably mounted above the forward end of the conveyor in a predetermined spaced apart relation,

drive means to rotate said rotary vine engaging members in opposed directions to engage and feed tomato vines cut by said cutter head onto said conveyor for movement into the main body portion of the harvester device, and

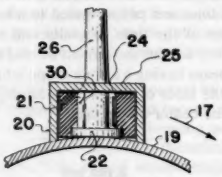
means operably connecting between a pair of existing opposed side hydraulic cylinder and piston assemblies and said cutter head to respond to said cutter head vertical pivotal movement to raise and lower the forward position of the conveyor in direct relation to the vertical variations in the ground level to automatically compensate for said variations in a manner so as to maintain said cutter teeth at a substantially constant elevation above the surface of the ground, the hydraulic cylinder and piston assemblies conventionally providing for manual control of raising and lowering of the conveyor.

4,189,907

PICK UP TINE

Victor Erdman, 2602-4th Ave. S., Lethbridge, Alberta, Canada

Filed May 15, 1978, Ser. No. 906,117
Int. Cl.[2] A01D 77/08
U.S. Cl. 56—400 8 Claims



1. A flexible tine for mounting in a pick up portion of a grain harvester pick up, pick up reel for grain harvesters, side delivery rake, windrower, hay baler and the like comprising in combination an elongated tine portion and a base portion on said tine portion, the cross sectional configuration of said tine portion adjacent said base portion having a major axis and a minor axis with the length of the major axis being greater than the length of the minor axis thereby forming a tine having a lesser resistance to bending when said major axis is at right angles to the direction of travel and a greater resistance to bending when said major axis is parallel to the direction of travel, and means adjacent the base portion of said tine to detachably and selectively lock said tine in either desired relationship relative to said pick up portion.

4,189,908

FLEXIBLE RAKE

George F. Brock, Jr., 1025 Fallen Leaf Rd., Arcadia, Calif. 91006

Filed Feb. 21, 1978, Ser. No. 879,383
Int. Cl.[2] A01D 7/02, 7/06
U.S. Cl. 56—400.17 8 Claims

1. A flexible rake comprising:

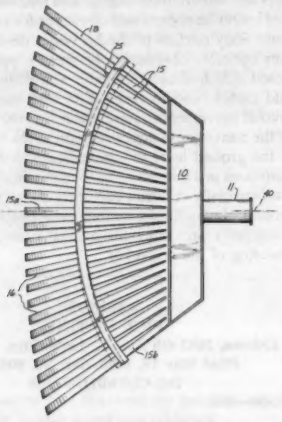
a supporting panel adapted to be held by a handle extending rearwardly from the panel;

a plurality of flexible tines rigidly connected to said panel spaced laterally from each other and extending generally forwardly from the panel in a fan-like array, the forward tips of said tines curving downward for raking debris;

tine-retaining strip means extending laterally across the tines

in a convex arc the most forward part of which is in the region of the central part of the rake;

said strip means comprising two overlaying strips, one passing across the upper surfaces of the tines and the other passing across the under surfaces of the tines, and separation means at least a plurality of which interconnect said



strips, and all of which extend into the spaces between adjacent tines and proportioned to allow free but limited movement of the tines, laterally and vertically and also limited fore-and-aft movement of said strip means; and

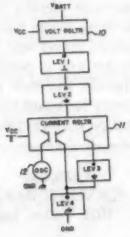
said strip means having a crown shape which causes the tines toward the sides of the rake to be depressed relative to tines at the center of the rake.

4,189,909

INTEGRATED INJECTION LOGIC ELECTRONIC SYSTEM WITH VOLTAGE REGULATOR FOR MULTIPLEXED LIQUID CRYSTAL DISPLAY

Steven E. Marum, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 22, 1978, Ser. No. 908,336
Int. Cl.[2] G04C *5/00*; G04B *19/30, 17/00*
U.S. Cl. 58—23 R **10 Claims**



1. An I^2L system comprised of:

(a) a current regulator coupled in series between first and second hierarchal levels of I^2L circuitry to receive output current from said first of I^2L circuitry and provide regulated current for said second level of I^2L circuitry;

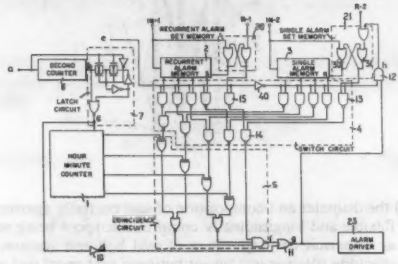
(b) a voltage regulator coupled in said series between the first level of I^2L circuitry and a terminal for connection to a voltage source, said voltage regulator for producing a regulated voltage for driving a display, said current regulator including a center tap for producing a regulated fractional voltage for driving said display.

4,189,910

ELECTRONIC WATCH WITH ALARM MECHANISM

Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 21, 1976, Ser. No. 734,465
Claims priority, application Japan, Oct. 28, 1975, 50-129583
Int. Cl.[2] G04C *21/00*
U.S. Cl. 58—38 R **1 Claim**



1. In an electronic watch:

a time counter for counting a repetitive time standard signal, having a repetitive rate representative of an interval of time, to develop a count representative of present time;

a recurrent alarm time memory circuit for storing a recurrent alarm time therein;

a single alarm time memory circuit for storing a once-occurring alarm time and having a reset input;

an R-S flip-flop circuit for clearing the contents of said single alarm time memory circuit, said R-S flip-flop circuit having a first output terminal for developing an enabling signal when set flip-flop is in the set condition, a second output terminal to the reset input of said single alarm time memory for resetting the same when said flip-flop is reset, a set input connected for receiving a single alarm time memory circuit setting signal and a reset input;

a coincidence detecting circuit for detecting coincidence between the contents of said time counter and the contents of said memory circuits and for developing an output signal when coincidence is detected;

switching means for alternately applying the contents of said recurrent alarm time memory and said single alarm time memory to said coincidence detecting circuit to effect comparison between the contents of said time counter and alternate ones of said memories in response to the enabling signal from said R-S flip-flop and for applying the contents of only said recurrent alarm time memory in the absence of the enabling signal;

means responsive to the output signal of said coincidence detecting circuit for resetting said R-S flip-flop circuit to clear said single alarm time memory after the once-occurring alarm time has occurred;

and alarm means responsive to the output signal of said coincidence detecting circuit for developing an alarm signal each time the contents of said time counter coincides with the contents of one of said memories.

4,189,911

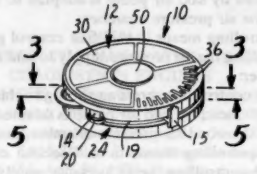
TOY TIMING DEVICE

James F. Kubiatowicz, Minneapolis, Minn., assignor to Custom Concepts Incorporated, Minneapolis, Minn.

Filed Jun. 12, 1978, Ser. No. 914,438
Int. Cl.[2] A63H *33/30*
U.S. Cl. 58—106 **9 Claims**

1. A mechanism comprising a first member having spaced projections, a second member mounted on the first member to

afford relative movement of the members between start and stop positions and having a friction surface that moves relative to and has portions between said projections during said relative movement, means for biasing the members toward their stop position with a force which decreases upon relative movement of the members from their start toward their stop position, and a length of elastic resilient material tensioned between said projections across and in engagement along one side with said friction surface, said friction surface being generally in the



plane of movement of said members except for a portion defined by a rib which projects normal to the direction of movement and decreases generally uniformly in height from a portion between the projections in the start position of the members along portions which pass between the projections as the members move toward their stop position to decrease the frictional engagement between the frictional surface and the elastic material and provide a slow and generally constant relative velocity for the members.

4,189,912

COMBINATION CALCULATOR AND TIMEPIECE

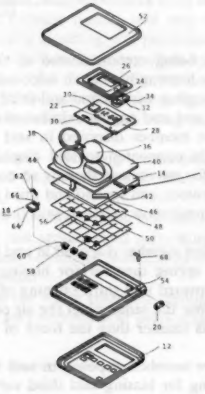
Isamu Washizuka, Kyoto; Junji Aoki, Kashiwara, and Tadashi Tomino, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1977, Ser. No. 801,002

Claims priority, application Japan, May 31, 1976, 51-71852[U]

Int. Cl.² G04B *37/12*

U.S. Cl. 58—152 R **9 Claims**



1. A combination calculator and timepiece, comprising:

a housing means for defining and enclosing a cavity containing a variety of electrical components, said housing means having a first and a second major surface, the external side of said first major surface facing in a first direction, the external side of said second major surface facing in a second direction, said first direction being substantially opposed to and opposite from said second direction, said housing means further accommodating a means for introducing numerical information into said combination calculator and timepiece, said cavity of said housing means further containing a base frequency signal generator, a power supply, a power supply switch, a computation circuit means for calculator operation, a time information keeping circuit means for timepiece operation, a first digital display means for displaying information stored in said computation circuit means, and a second digital display means for displaying information stored in said time information keeping circuit means, said combination calculator and timepiece further comprising;

a common substrate means disposed within said cavity of said housing means for dividing said cavity of said housing means into a first compartment and a second compartment, said first digital display being supported by said common substrate and located within said first compartment, said first major surface of said housing means having a first window means disposed therethrough thereby defining a first hole in said first major surface for viewing a display within said housing means, said first digital display being visible from a position external to said housing means through said first window means disposed in said first major surface of said housing means,

said means for introducing numerical information into said combination calculator and timepiece comprising a plurality of key switch means secured on said common substrate means and disposed within said first compartment for introducing information into said combination calculator and timepiece, said first major surface further including a plurality of openings disposed therethrough, said plurality of key switch means being visible from a position external to said housing means and protruding through said plurality of openings in said first major surface of said housing means,

said second digital display being supported by said common substrate and disposed within said second compartment, said second major surface of said housing means having a second window means disposed therethrough thereby defining a second hole in said second major surface for viewing a display within said housing means, said second digital display being visible from a position external to said housing through said second window means disposed on said second major surface of said housing means; and

a time correction switch means secured by said common substrate and disposed within said second compartment for introducing a time correction command into said combination calculator and timepiece,

said second major surface further including at least one opening disposed therethrough, said time correction switch means being visible from a position external to said housing and protruding through said at least one opening in said second major surface of said housing means.

4,189,913

REFLEX AIR BURNER WITH AIRBLAST START

Denis R. Carlisle, Risley, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 7, 1978, Ser. No. 875,932

Claims priority, application United Kingdom, Feb. 11, 1977, 5885/77

Int. Cl.² F02O *7/22, 7/26*

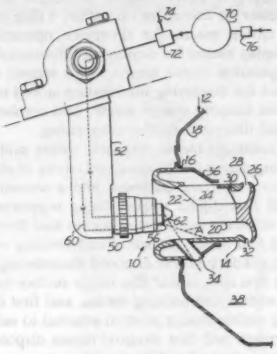
U.S. Cl. 60—39.14 R **5 Claims**

1. Combustion equipment for a gas turbine engine comprising:

a combustion chamber including a primary zone, a first duct extending into the primary zone, and a plurality of second ducts extending from said first duct into said primary zone; and

a fuel nozzle comprising a plurality of fuel outlets arranged to direct fuel through said first duct and into said primary zone during normal operation of the gas turbine engine, there being at least as many fuel outlets as there are said

plurality of second ducts, and fuel directing means arranged to impinge air onto fuel discharged from at least a number of said fuel outlets and to direct the same into a



corresponding number of said plurality of second ducts to provide a fuel and air mixture through said second ducts for discharge into said primary zone of said combustion chamber.

4,189,914

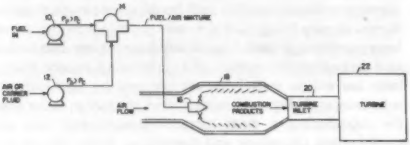
SUPERCRITICAL FUEL INJECTION SYSTEM

Cecil J. Marek, Shaker Heights, and Larry P. Cooper, Strongsville, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 19, 1978, Ser. No. 916,654

Int. Cl.[2] F02C 7/22

U.S. Cl. 60—726 **7 Claims**



1. A fuel injection system comprising means defining a combustion volume; means for supplying pressurized fuel at a pressure above the critical pressure thereof, means for supplying a pressurized carrier fluid at a pressure above the critical pressure of the fuel, mixing means for mixing said pressurized fuel and said pressurized carrier fluid to produce a fuel/carrier fluid mixture, and means for supplying said fuel/carrier fluid mixture to said combustion volume for combustion therein.

4,189,915

SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Motohisa Miura, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 26, 1978, Ser. No. 900,308

Claims priority, application Japan, Apr. 28, 1977, 52-49410

Int. Cl.[2] F01N 3/10

U.S. Cl. 60—290 **5 Claims**

1. A secondary air supply system for an internal combustion engine, comprising:

an air pump adapted to be driven by an engine;

a secondary air supply line extending between said air pump and the engine exhaust system;

valve means in said secondary air supply line for controlling the secondary air supply from said air pump into said engine exhaust system;

a valve actuator operatively associated with said valve means and comprising first and second air pressure chambers, a diaphragm between said air pressure chambers, a first spring member disposed in said first air pressure chamber to yieldably act on said diaphragm and restricted passage means intercommunicating said first and second air pressure chambers;

a first control pressure line through which the air pressure produced by said air pump is adapted to be supplied into said first air pressure chamber;

first controlling means in said first control pressure line for controlling the air pressure supply to said first air pressure chamber;

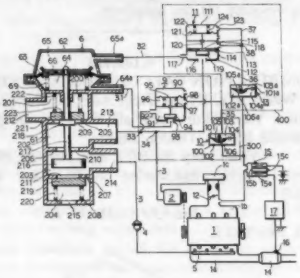
a second control pressure line through which the air pressure produced by said air pump is adapted to be supplied into said second air pressure chamber; and

second controlling means in said second control pressure line for controlling the air pressure supply to said second air pressure chamber;

wherein said valve means includes:

a valve housing defining therein a generally cylindrical space;

first to third partition walls disposed in said space to divide in into first to fourth chambers, said partition walls having respective first to third openings to communicate the opposed chambers with each other, said first and fourth



chambers being communicated to the atmosphere, and said valve housing having air inlet and outlet respectively communicating said second and third chambers with said air pump and said engine exhaust system;

a first valve member disposed in said third chamber and operatively connected to said diaphragm of said valve actuator for movement thereby to control the communication between said second and third chambers as well as the communication between said third and fourth chambers;

a second valve member disposed in said fourth chamber and a second spring member for biasing said second valve member toward said third opening of said third partition wall to close the same when the air pressure in said third chamber is smaller than the force of said second spring; and

a third valve member disposed in said first chamber and a third spring for biasing said third valve member toward said first opening of said first partition wall to close the same when the air pressure in said second chamber is smaller than the force of said third spring, said third valve member being linked to said first valve member in such a manner that said third valve member is moved away from said first opening to open the same when the movement of said first valve member toward said second opening of said second partition wall exceeds a predetermined stroke,

said first controlling means being operative to interrupt the supply of the air pressure into said first air pressure cham-

ber while said second controlling means being operative to supply the air pressure into said second air pressure chamber at least at the initial stage of an engine acceleration operation whereby said first valve member is driven toward said third opening to close the same to thereby supply an increased amount of secondary air to said engine exhaust system.

4,189,916

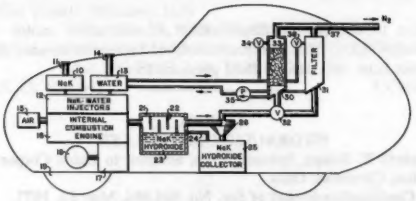
VEHICLE SYSTEM FOR NAK-WATER-AIR INTERNAL COMBUSTION ENGINES

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 301,285, Oct. 27, 1972, abandoned, and a continuation-in-part of Ser. No. 457,207, Apr. 2, 1974, Pat. No. 3,911,284, and a continuation-in-part of Ser. No. 464,454, Apr. 26, 1974, abandoned, and a continuation-in-part of Ser. No. 578,527, May 19, 1975, Pat. No. 4,020,798. This application Mar. 21, 1977, Ser. No. 779,788

Int. Cl.[2] F02C *3/20*; F01N *3/02*

U.S. Cl. 60—311 **1 Claim**



1. A method for separating alkali hydroxide particulates from exhaust gases comprising the steps of

reacting an alkali metal, water from a water reservoir, and air in a combustion chamber to form said particulates and gases,

separating a portion of said particulates from said gases in a first stage of an exhaust system, said step of separating comprising directing directing said particulates and gases to impinge upon a surface of molten alkali hydroxide, said surface retaining at least some of the particulates,

directing flow of remaining particulates and gases through a first filter, said first filter accumulating said remaining particulates,

directing flow of said remaining particulates and gases through a second filter, said second filter accumulating said particulates,

passing water from said water reservoir through said first filter to remove said accumulated particulates,

directing flow of said remaining particulates and gases back to the first filter, and

passing water from the water reservoir through the second filter to remove said accumulated particulates.

4,189,917

AIR HAMMER AND MUFFLER COMBINATION

Samuel D. Gunning, Cleveland Heights, Ohio, assignor to Kent Air Tool Company, Kent, Ohio

Filed Sep. 18, 1978, Ser. No. 943,324

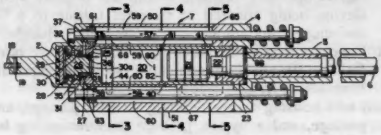
Int. Cl.[2] F15B *11/06*

U.S. Cl. 60—370 **19 Claims**

1. An air hammer including a body having a bore, an inlet passage, and an exhaust passage;

a piston reciprocable in the bore by pressurized air;

a muffler on the body for muffling the exhaust of the air; and



means rendered operative by removal of the muffler from the body, to render the piston inoperable by the pressurized air.

4,189,918

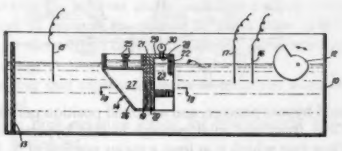
DEVICES FOR EXTRACTING ENERGY FROM WAVE POWER

George W. Moody, East Kilbride, and Robert A. Meir, Cambustang, both of Scotland, assignors to The Secretary of State for Energy in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 14, 1978, Ser. No. 933,671

Int. Cl.[2] F03B *13/12*

U.S. Cl. 60—398 **8 Claims**



1. A device for extracting energy from waves on a liquid upon which the device is adapted to float, wherein the improvement comprises,

(a) the device being free to move in response to said waves in a vertical plane aligned in the direction of propagation of the waves incoming towards the device, and

(b) that portion of the device adapted to be below the surface of the liquid being of asymmetric shape in said vertical plane; said shape, the position of the centre of gravity of the device, and the value of the radius of gyration about the centre of gravity in said plane being arranged so that the motion of the device in response to said waves inhibits to a substantial extent the transmission and reflection of waves by the device itself.

4,189,919

MOTOR-VALVE APPARATUS FOR HYDRAULIC FAN DRIVE SYSTEM

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 907,064, May 18, 1978. This application Dec. 6, 1978, Ser. No. 966,984

Int. Cl.[2] F15B *11/16*

U.S. Cl. 60—420 **11 Claims**

1. Motor-valve apparatus for use in a hydraulic fan drive system including a pump having a fluid outlet port, a fluid inlet port, and a pumping element operable to deliver fluid at a rate proportional to engine speed, the pump comprising the sole source of pressurized fluid for the system and including flow control valve means operable to limit the fluid delivery rate of the pump to X at higher engine speeds, said motor-valve apparatus comprising:

(a) housing means defining an inlet port for connection to the outlet port of the pump and further defining at least one

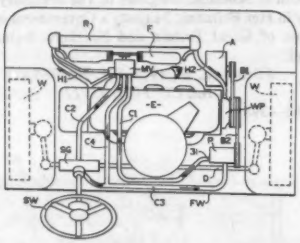
outlet port, said one outlet port being in fluid communication with the inlet port of the pump;

(b) a positive displacement, fluid pressure actuated rotary device operably disposed within said housing means, said device being adapted to transmit torque to a fan, and defining expanding and contracting fluid chambers;

(c) said housing means defining a fluid pressure port and a fluid return port communicating with said expanding and contracting fluid chambers respectively;

(d) said housing means defining an inlet passage, an outlet passage, and a bypass passage communicating between said inlet and outlet passage, said inlet passage permitting fluid communication between said inlet port and said pressure port, and said outlet passage providing fluid communication between said return port and said outlet port;

(e) bypass valve means disposed in one of said inlet passage and said bypass passage and including a bypass valve member movable between a first position substantially preventing fluid communication from said inlet passage to



said bypass passage, and a second position permitting fluid flow from said inlet passage to said bypass passage at a flow rate which is at least a major portion of X, the bypass flow through said bypass passage and the return flow through said return port being recombined in said outlet passage;

(f) said valve member being biased toward said second position by fluid pressure in said inlet passage;

(g) said valve means or said housing means and said valve means defining a signal chamber, said valve member being biased toward said first position by fluid pressure in said signal chamber;

(h) means communicating pressurized fluid into said signal chamber; and

(i) pilot valve means operable in response to changes in a predetermined condition between a first position blocking fluid communication between said signal chamber and said outlet passage, and a second position permitting fluid communication from said signal chamber to said outlet passage.

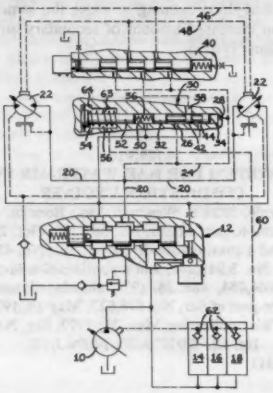
4,189,920

LOAD SIGNAL CONTROL OF HYDRAULIC MOTOR DISPLACEMENT

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 8, 1979, Ser. No. 35,120
Int. Cl.[2] F15B *11/16*
U.S. Cl. 60—420 **7 Claims**

1. In a vehicle drive and work performing system including a rotary output variable displacement hydraulic drive motor (22) adapted to drive a vehicle, at least one hydraulic implement motor (14, 16, 18) adapted to power a work performing implement, a hydraulic pump (10) for providing hydraulic fluid under pressure to said motors, a flow control valve (12) for controlling fluid flow from the pump to at least the drive motor, and a pressure control valve (30) for controlling the displacement of the drive motor to achieve a desired fluid pressure level at the drive motor, the improvement comprising load sensing means (60,62) connected to said implement motor for providing a signal representing the load thereon, and means (54) responsive to said signal for causing the pressure control



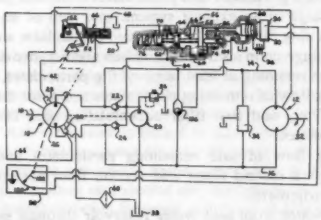
valve to change the displacement of said drive motor to thereby change the fluid pressure level thereat to a value different from said desired fluid pressure level.

4,189,921

HYDRAULIC CONTROLLER

Kenneth K. Knapp, Spencer, Iowa, assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 801,884, May 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 701,790, Jul. 2, 1976, abandoned. This application Feb. 22, 1979, Ser. No. 14,171
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—445 **35 Claims**



1. A control for use with a variable hydraulic pump unit or motor unit having fluid operable means for varying the displacement of said unit, a source of fluid under pressure, and a drain, said control comprising:

(a) a housing defining a bore;

(b) a first port in said housing communicating with said bore and adapted for fluid communication with said fluid operable means;

(c) a second port in said housing communicating with said bore and adapted for fluid communication with said source of fluid;

(d) a third port in said housing communicating with said bore and adapted for fluid communication with said drain;

(e) a fourth port in said housing communicating with said bore and adapted for fluid communication with said fluid operable means;

(f) valve means in said bore for selectively communicating said ports with one another, said valve means having a first

position communicating said first port solely with said second port and said third port solely with said fourth port, a second position communicating said first and fourth ports solely with said third port, and a third position communicating said fourth port solely with said second port and said first port solely with said third port, said valve means is moved through said positions from said first to said second to said third to said second to said first;

(g) first biasing means to bias said valve means toward said first position;

(h) second biasing means to bias said valve means toward said third position, said second biasing means including:

(i) a fluid chamber,

(ii) inlet conduit means adapted to communicate a source of fluid under pressure with said fluid chamber,

(iii) means responsive to the pressure of fluid within said fluid chamber to bias said valve means toward said third position, and

(iv) means responsive to a signal to vary the pressure of the fluid within said fluid chamber.

4,189,922

CONVERTING SOLAR ENERGY INTO ELECTRIC POWER

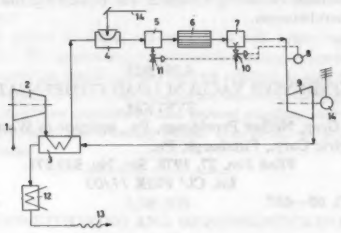
Oreste Bellofatto, Milan, Italy, assignor to Snamprogetti S.p.A., San Donato Milanese, Italy

Filed Mar. 8, 1978, Ser. No. 884,400

Claims priority, application Italy, Mar. 22, 1977, 21483 A/77

Int. Cl.[2] F03G *7/06*; F02C *1/04, 1/06*

U.S. Cl. 60—641 **4 Claims**



1. A method for the production of electric power by exploiting solar energy and using an expansion turbine unit, comprising the steps of compressing ambient air up to a pressure of at least from 6 to 30 bars, preheating the ambient air with the heat of the air emerging from the expansion turbine unit, further heating the preheated and compressed air in a solar heater to a temperature of at least from 500° C. to 900° C., causing the heated and compressed air to flow first through a combustion system actuated at the start of the method, then through a heat accumulator and through an auxiliary burner actuated when the solar energy is inadequate, allowing the heated and compressed air to be expanded in the turbine unit to which the electric power generator is connected, and recycling the air after the expansion in the turbine unit for at least preheating the ambient air.

4,189,923

GEOTHERMAL ENERGY RECOVERY

Clyde Berg, 3655 E. Ocean Blvd., Ste. 2-H, Long Beach, Calif. 90803

Filed Mar. 22, 1978, Ser. No. 889,038

The portion of the term of this patent subsequent to Nov. 22, 1994, has been disclaimed.

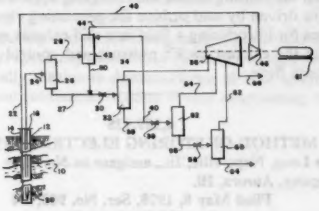
Int. Cl.[2] F03G *7/00*

U.S. Cl. 60—641 **11 Claims**

1. A method for recovery of energy and production of useful work from a high temperature geothermal brine in a well substantially filled with said brine with a casing having a production tubing in communciation therewith at its lower end and which comprises:

(a) introducing a vapor under high pressure into said casing and passing said vapor as a confined stream to a subterranean depth in said casing;

(b) injecting said vapor into said production tubing to admix with said brine therein and to form an intimate mixture with said brine having a density sufficiently less than the density of said brine whereby said brine in said casing surrounding said production tubing exerts a hydrostatic head on said mixture to lift said mixture to the surface through said tubing;



(c) discharging said mixture from said tubing into a vessel and separating said mixture into vapor and brine while maintaining the mixture under superatmospheric pressure sufficient to prevent the release of gases from said brine and the concomittant deposit of calcium carbonate scale in said tubing;

(d) expanding said separated vapor to generate work therefrom; and

(e) forming high pressure vapor for introduction into said casing in step (a).

4,189,924

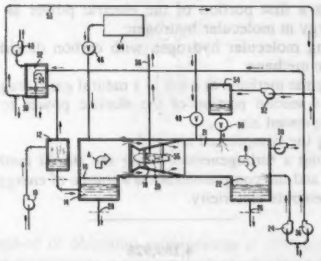
OCEAN THERMAL ENERGY CONVERSION SYSTEM AND METHOD FOR OPERATION

Bernard L. LaCoste, Wilmington, Del., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1978, Ser. No. 918,127

Int. Cl.[2] F03G *7/04*

U.S. Cl. 60—641 **12 Claims**



1. An ocean thermal energy conversion system comprising:

a flash evaporator for vaporizing water supplied thereto into steam, said steam being at a lower pressure than said water, said evaporator including means for separating the resulting steam and unflashed water;

first means for pumping relatively warm ocean water to said flash evaporator;

turbine means for expanding steam within a subatmospheric pressure range of less than 15 pounds per square inch and converting its expansion energy into mechanical energy,

said turbine means having a steam inlet, steam outlet, and exhaust neck, said steam inlet being in fluid communication with said flash evaporator, said steam outlet constituting a port through which expanded steam is exhaustible into the exhaust neck;

means for condensing steam exhausted from said turbine means, said condensing means including an enclosing structure which is in fluid communication through said exhaust neck with said steam outlet, said condensing means including an intermingling apparatus for mixing relatively cold ocean water with the exhausted steam within the enclosing structure to cause the steam to condense;

second means for pumping relatively cold ocean water to said condensing means intermingling apparatus;

means driven by said turbine for generating electricity; and

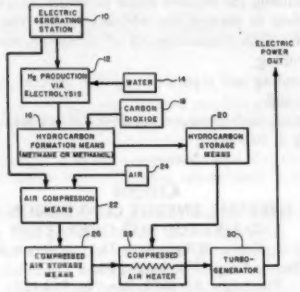
means for introducing a fluid into said exhaust neck to regulate the exhaust neck's pressure and control the tubine's steam flow.

4,189,925

METHOD OF STORING ELECTRIC POWER

George Long, Naperville, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed May 8, 1978, Ser. No. 903,754
Int. Cl.[2] F01K *13/00*
U.S. Cl. 60—652 **9 Claims**



9. A method for storing electric power generated during off peak periods and later utilizing the stored power to generate additional electric power comprising the following steps:

storing a first portion of the electric power as chemical energy in molecular hydrogen;

reacting molecular hydrogen with carbon dioxide to produce methane;

storing the methane as a gas in a natural gas storage facility;

using a second portion of the electric power to produce compressed air;

storing the compressed air; and

operating a turbogenerator using the stored methane as a fuel and the compressed air as a source of energy in order to generate electricity.

4,189,926

TURBINE-CONDENSER SUPPORT SYSTEM

James J. Hsu, Cincinnati, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1978, Ser. No. 915,690
Int. Cl.[2] F01K *11/00*
U.S. Cl. 60—687 **5 Claims**

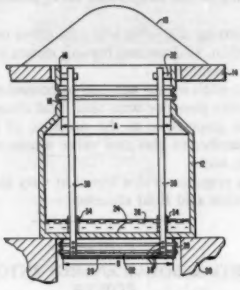
1. A turbine-condenser support configuration comprising:

an elastic fluid turbine having an exhaust port for exhausting motive fluid therethrough;

a support structure for bolstering said turbine;

a condensing apparatus in fluid communication with said turbine through said exhaust port, said condenser constituting an enclosure within which the motive fluid is condensed and an outer wall which is flexibly joined thereto to define a vacuum balancing chamber, said flexible joint permitting relative movement of said enclosure and outer wall; and

means for rigidly connecting said outer wall to said turbine,



said connecting means providing atmospheric pressure force transmissibility from said outer wall so as to reduce the load on the turbine's support structure;

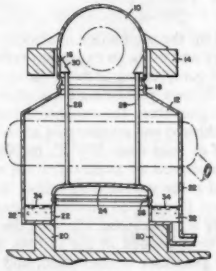
said connecting means comprising a plurality of conduits which extend through said enclosure and provide fluid communication between the turbine's exhaust port and vacuum balancing chamber for equalizing the pressure therebetween.

4,189,927

CONDENSER VACUUM LOAD COMPENSATING SYSTEM

Lewis Gray, Nether Providence, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 27, 1978, Ser. No. 919,571
Int. Cl.[2] F01K *11/00*
U.S. Cl. 60—687 **6 Claims**



1. A turbine-condenser support configuration comprising:

a turbine having an exhaust port for exhausting motive fluid therethrough;

a foundation structure for supporting said turbine;

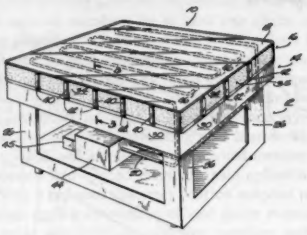
a condensing apparatus for condensing motive fluid, said condensing apparatus being in fluid communication with said exhaust port and having first and second enclosing portions, said first portion being flexibly connected to said turbine and said second portion, said first portion including a floor, said second portion being disposed above the floor; and

means for structurally connecting said second enclosing portion to said turbine so as to reduce the operational load on said turbine foundation.

4,189,928
ICE TOP MEAT CUTTING APPARATUS

Adrian F. Cerny, P.O. Box 44, Bloomington, Wis. 53084

Filed Aug. 23, 1978, Ser. No. 936,023
Int. Cl.[2] F25C 1/12
U.S. Cl. 62—66 15 Claims



15. An ice top meat cutting apparatus comprising:

a frame having an upper support member extending substantially above floor level;

enclosure means connected to said upper support member for movement to a first position for defining an enclosure having an open top and for containing liquid which can be frozen to provide an ice top having an upper cutting surface suitable for cutting meat thereon, and movable to a second position displaced from said first position for providing said ice top with an unobstructed upper cutting surface;

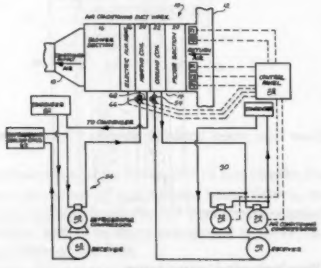
support means movable connected to said upper support member for supporting said enclosure means when in said first position, and for being moved relative to said enclosure means to allow said enclosure means to be displaced from said first position to said second position; and

cooling means for freezing liquid contained within said enclosure.

4,189,929
AIR CONDITIONING AND DEHUMIDIFICATION SYSTEM

Lillard G. Russell, Salisbury, N.C., assignor to W. A. Brown & Son, Inc., Salisbury, N.C.

Filed Mar. 13, 1978, Ser. No. 885,967
Int. Cl.[2] F25D 17/04
U.S. Cl. 62—175 13 Claims



1. An air conditioning and dehumidification system comprising:

(a) means for compressing refrigerant and selectively operable at generally full and reduced capacities;

(b) means for evaporating refrigerant and having means for selectively operating at generally full and reduced capacities;

(c) means for directing compressed refrigerant from said compressing means to said evaporating means for evaporation therein; and

(d) means for controlling said compressing meand and said means for selectively operating said evaporating means selectively responsive to the temperature and moisture content of air ambient to said evaporating means for selectively:

(aa) operating said compressing means at full capacity and said evaporating means at full capacity for substantially maximum comfort cooling without substantial dehumidifying of said ambient air,

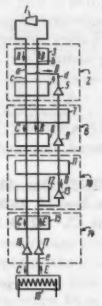
(bb) operating said compressing means at a reduced capacity and said evaporating means at a corresponding reduced capacity for corresponding reduced comfort cooling of said ambient air, and

(cc) operating said compressing means at full capacity and said evaporating means at a reduced capacity for substantially maximum dehumidifying of said ambient air without substantial frosting of said evaporating means.

4,189,930
METHOD OF OBTAINING REFRIGERATION AT CRYOGENIC LEVEL

Anatoly B. Davydov, ulitsa Udaltsova, 14, kv. 147; Sergei M. Korsakov-Bogatkov, 5 Parkovaya ulitsa, 56/6, kv. 74; Boris D. Krakovsky, Narodnaya ulitsa, 13, kv. 136; Vasily D. Nikitkin, Tsvetnoi bulvar, 25, kv. 95; Evgeny V. Onosovsky, ulitsa Z. i A. Kosmodemyanskikh, 8/7, kv. 131; Vladimir G. Pronko, B. Kozlovsky pereulok, 11, kv. 42; Leonid M. Stopler, Krasnobogatyrskaya ulitsa, 21, kv. 136; Boris A. Chernyshev, Smolenskaya naberezhnaya 2, kv. 16, and Boris A. Antipenkov, 1 Truzhenikov pereulok, 13, kv. 6, all of Moscow, U.S.S.R.

Filed Jun. 17, 1977, Ser. No. 807,745
Int. Cl.[2] F25B 1/00
U.S. Cl. 62—502 5 Claims



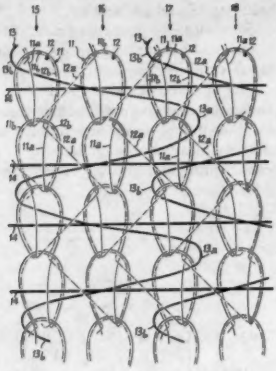
1. A method of obtaining refrigeration at cryogenic level comprising compressing a gaseous fluid constituting an incoming stream, stepwise cooling the incoming stream, expanding the incoming stream with its liquefaction, feeding the liquid fluid so formed to sustain at least one refrigerative load wherein the liquid is transformed into vapour constituting a return stream flowing back from the refrigerative load sustained, and adiabatically compressing the return stream flowing back from the refrigerative load so as to attain a temperature close to the temperature of the incoming stream before the expansion thereof with liquefaction; said stepwise cooling of the incoming stream being effected with said return stream.

4,189,931

COMPLEX STITCH FABRIC OF FLUFFY CHARACTER FOR LINING AND REINFORCING APPAREL AND METHOD OF MAKING SAME

Pierre Groshens, Peronne, France, assignor to Lainiere de Picardie, Peronne, France

Filed Sep. 3, 1975, Ser. No. 609,924
Claims priority, application France, Sep. 5, 1974, 74 30158
Int. Cl.[2] D04B *23/08*
U.S. Cl. 66—193 3 Claims



1. A warp knit fabric for use in making reinforcing plastrons for apparel comprising:

a base fabric having a sheet of relatively thin, flexible warp yarns knitted into stitches forming wales and courses, each yarn being knit alternately in separate wales which are connected by lengths of said yarn;

relatively thick, wiry weft yarns inlaid in the courses of said base fabric and lying between the stitches and the said connecting lengths of said warp yarns; and

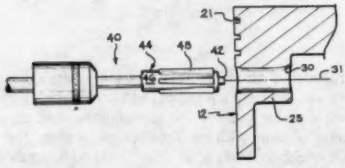
a plurality of inlaid, relatively thick and undulating warp yarns, each having a relatively roughened or napped surface and being tied to said base fabric by said connecting yarn lengths and overlying said inlaid weft yarns, each undulating warp yarn crossing a plurality of wales between succeeding undulations.

4,189,932

PISTON PIN BORE AND METHOD OF FINISHING

David F. Fielder, Richmond, Ind., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 752,221, Dec. 20, 1976, Pat. No. 4,124,010.
This application Jun. 12, 1978, Ser. No. 914,639
Int. Cl.[2] B21D *53/84*
U.S. Cl. 72—370 4 Claims



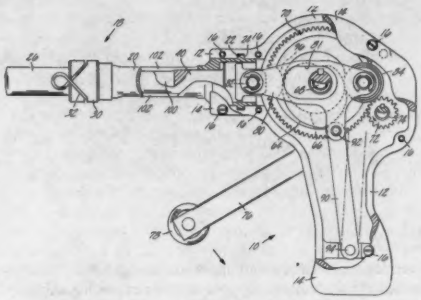
1. A method of finishing a piston pin bore in a piston comprising the steps of prestressing the bore, enlarging the diameter of at least one end portion of the bore, and smoothing the bore, wherein said steps of prestressing, enlarging and smoothing are accomplished substantially simultaneously by roll burnishing.

4,189,933

HAND OPERATED LOCKBOLT SETTING TOOL

David J. Holloway, Aldridge, England, assignor to USM Corporation, Farmington, Conn.

Filed Sep. 22, 1978, Ser. No. 944,711
Int. Cl.[2] B21J *15/34*
U.S. Cl. 72—391 8 Claims



1. A pull-type fastener-setting tool comprising:

a housing having a barrel portion;

an abutment on said barrel portion for engagement with one part of a fastener;

pulling means slidable in said housing for engaging a pulling stem of the fastener;

actuating means including a cam rotatably mounted in said housing and a cam-follower mounted on an arm pivotably connected to said pulling means, and

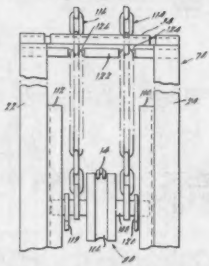
a link having one end thereof pivotably connected to said arm and the other end thereof pivotably connected to said housing at a point remote from said cam follower, whereby said cam follower reciprocates along an arc of substantially large radius without moving significantly out of aligment with said pulling means.

4,189,934

PULLING APPARATUS

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042

Filed Dec. 16, 1977, Ser. No. 861,200
Int. Cl.[2] B21D *1/12, 1/14*
U.S. Cl. 72—447 13 Claims



1. A pulling apparatus comprising:

a base member;

a pair of spaced vertically extending members each of said vertical members including an opposed facing longitudinally extending channel;

a first pair of spaced support members connected between each of said vertical members and said base member;

a second pair of spaced support members connected between each of said vertical members and said base member;

said first pair of support members being substantially longer than said second pair of support members and cooperating therewith to support said vertical members upon said base member;

guide means movably located between said opposed facing channels of said vertical members and movably supported from a load holding assembly supported on the upper ends of said vertical members by at least one chain, said load holding assembly including a load holding door having a slot adapted to receive one link of said chain and to prevent the next adjacent link from passing therethrough, said load holding assembly further including a pair of spaced members adapted to engage respective of said vertical members for supporting said load holding door therebetween and a rotatable cylindrical member extending between said spaced members, said cylindrical member having a reduced diameter portion adapted to receive said chain during movement of said guide means;

pulling means supported on said base member; and

flexible connecting means having one end connected to said pulling means and extending through said guide means, another end of said flexible connecting means being adapted to be connected to a workpiece;

said flexible connecting means, said guide means, and said pulling means cooperating to exert a pulling force upon said workpiece and anchor means disposed on the opposite side of said vertically extending members from said workpiece.

4,189,935

FOLDED SEAM CLOSING MACHINE

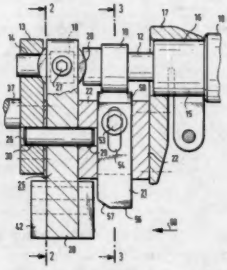
Franz Bleyer, Vienna, Austria, assignor to Peter Wukovich OHG, Vienna

Filed Feb. 27, 1978, Ser. No. 881,898

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714427

Int. Cl.² B21J *9/18*

U.S. Cl. 72—452 **11 Claims**



1. A machine for closing a folded seam, said machine comprising:

at least two opposing cheeks, one of said cheeks formed as an anvil, the other of said cheeks being driven, said at least two opposing cheeks further comprising opposed complementary helical surfaces juxtaposed to carry out the shaping action of the fold;

eccentric drive means engaging said cheeks for executing an impact movement of the cheeks on a fold located between one and the other of said cheeks; and

a hammer mounted contiguous to said eccentric drive means for striking said fold, said hammer cooperating with said eccentric drive means to execute an impact movement of the hammer transversely to the direction of movement of the cheeks, said hammer striking said fold further being located in a first position following the cheeks in the direction of operation.

4,189,936

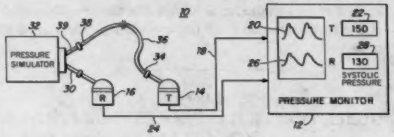
PRESSURE GENERATOR

David M. Ellis, 11 Fern Way, Bedford, Mass. 01730

Filed Oct. 13, 1978, Ser. No. 951,021

Int. Cl.² G01L *27/00*

U.S. Cl. 73—4 R **3 Claims**



1. A pressure measuring system comprising:

a high compliance pressure generator for producing a predetermined pressure variation pattern;

a reference pressure transducer connected directly to said pressure generator for directly sensing the pressure produced therein;

a test pressure transducer connected through tubing to said pressure generator for sensing the pressure transmitted through said tubing from said pressure generator; and

a pressure monitor responsive to said test transducer to indicate the pressure sensed through said tubing and responsive to said reference transducer to indicate the pressure sensed directly at said pressure generator for determining the difference in the pressure variation pattern introduced by the tubing.

4,189,937

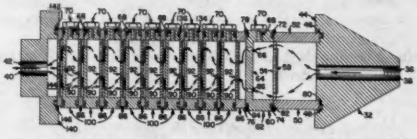
BOUNCELESS HIGH PRESSURE DROP CASCADE IMPACTOR AND A METHOD FOR DETERMINING PARTICLE SIZE DISTRIBUTION OF AN AEROSOL

Philip A. Nelson, 18615 SE. Covington Sawyer Rd., Kent, Wash. 98031

Continuation-in-part of Ser. No. 464,158, Apr. 25, 1974, abandoned. This application Aug. 3, 1977, Ser. No. 821,608

Int. Cl.² G01N *15/02*

U.S. Cl. 73—28 **23 Claims**



1. A cascade impactor for sampling a particle laden gas for particle size distribution, said impactor comprising:

a. a gas inlet and a gas exit;

b. a plurality of stages, each stage comprising a jet plate and a collector plate except that the first jet plate may be a part of or may be replaced by the inlet nozzle;

c. a collector plate downstream from each jet plate, and a jet plate upstream from each collector plate;

d. each jet plate having one or more hole(s) through which the particle laden gas passes wherein said hole(s) are positioned so that the gas from the jet plate is directed to the collector surface on the respective collector plate downstream from said jet plate;

e. a fluid flow path between each collector plate and the jet plate immediately downstream and which path allows relatively unrestrained flow of the particle laden gas from each collector plate to the next succeeding jet plate;

f. appropriate sealing means between a jet plate and a collector plate to cause the gas to flow entirely through the jet plate holes and through the designated passageways between collector plate and succeeding jet plate; and, one or

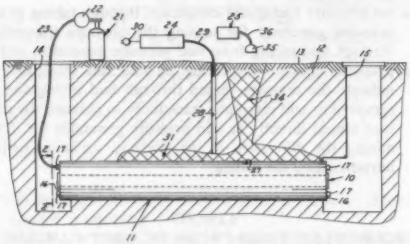
more said jet plates vary in thickness and in which jet plates the jet hole is less than 0.10 inch in diameter and in which the ratio of the length of a jet hole to the diameter of said jet hole to the diameter of said jet hole is greater than 8, and expressed as t/D is greater than 8, and where t is defined as the length of the cylindrical section of the jet hole and for square edged holes, t equals the thickness of the jet plate and with the edges of the jet hole countersunk t is less than the thickness of the jet plate and D is equal to the diameter of the cylindrical section of the jet hole.

4,189,938

DOUBLE TRACER GAS PROCESS FOR LOCATING CONDUIT LEAKS

Paul M. Heim, Franklin, Mass., assignor to Heath Consultants, Incorporated, Stoughton, Mass.

Filed Dec. 13, 1978, Ser. No. 969,284
Int. Cl.[2] G01M 3/22
U.S. Cl. 73—40.7 **3 Claims**



1. A double tracer gas process for locating conduit leaks in a conduit, comprising the steps of:

(a) inserting a double tracer gas comprising a mixture of a lighter than air gas which will rise to the surface from a leak in the conduit and be vented to the atmosphere, and a heavier than air gas which will escape from a leak in the conduit into the sub-surface atmosphere around the conduit;

(b) detecting the leakage of the lighter than air hydrocarbon gas by a flame ionization detector; and,

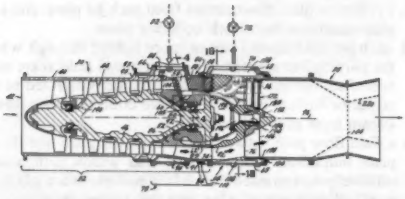
(c) detecting the leakage of the heavier than air gas by a gas detection means.

4,189,939

COMPACT MULTIMISSION AIRCRAFT PROPULSION SIMULATOR

Harrison West, and Bobby R. Delaney, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 12, 1977, Ser. No. 860,032
Int. Cl.[2] G01L 3/00
U.S. Cl. 73—116 **45 Claims**



8. A compact multipurpose aircraft propulsion simulator for simulating the in-flight aerodynamic characteristics of a gas turbine engine comprising:

a flow inlet sized to a reduced size linear scale in relation to the engine to be simulated;

a compressor sized to pressurize a flow of air from said inlet substantially identical to that of the engine to be simulated times the square of the linear scale factor;

a turbine drivingly connected to said compressor;

means for routing an externally generated flow of high pressure motive air to said turbine to rotationally drive said turbine and compressor;

means for mixing a portion of the turbine motive air with the air pressurized by the compressor to generate a mixture having a generally uniform pressure profile with a pressure ratio across the simulator substantially identical to the engine to be simulated; and

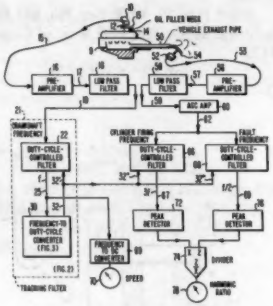
a nozzle downstream of said mixing means, sized substantially identical to the engine to be simulated times the linear scale factor and having associated therewith a nozzle flow function substantially identical to the engine to be simulated, for discharging said mixture as a propulsive jet.

4,189,940

ENGINE FAULT DIAGNOSIS

Leonard R. Hulls, Marblehead; Stephen C. Hadden, Acton, and Lee R. Armstrong, Newton, all of Mass., assignors to RCA Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,891
Int. Cl.[2] G01M 15/00
U.S. Cl. 73—117.3 **4 Claims**



1. An engine diagnostic apparatus, comprising

a tachometer for generating an electrical signal varying in proportion with engine speed, said tachometer including a transducer for translating a cyclic variation within the engine to a corresponding electrical signal having a frequency component which varies in frequency in direct proportion with engine speed,

a second transducer for translating a pressure waveform at the exhaust opening of said engine into a corresponding electrical waveform having frequency components which vary in frequency in proportion with engine speed,

a first controllable filter which passes and tracks a cylinder firing frequency component in the output of one of said transducers under control of the electrical signal from said tachometer, and

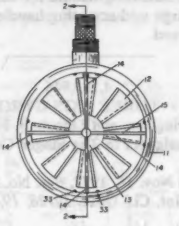
a second controllable filter which passes and tracks a fault frequency component in the output of said second transducer under control of the electrical signal from said tachometer, and

means to compare the outputs of said first and second controllable filters.

4,189,941
VANE STRAIGHTENER RETAINER

Stanley B. Loesch, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 856,476, Dec. 1, 1977, Pat. No. 4,122,717. This application Oct. 26, 1978, Ser. No. 954,814
Int. Cl.[2] G01F *1/10, 15/18*
U.S. Cl. 73—231 R 6 Claims



1. A fluid flow straightening device comprising:

a hollow housing having a recessed area extending about a portion of the interior surface of said hollow housing and through only a portion of the thickness of said hollow housing;

fluid flow straightening means including a central member having bore means therein;

retaining means having a portion inserted in the recessed area in said hollow housing and having portions substantially conforming to a portion of the exterior surface of said fluid flow straightening means, said retaining means comprising:

a center portion having an aperture therein; and

a plurality of radial members secured to the center portion with at least one radial member having deformable tab means thereon substantially conforming to a portion of the exterior surface of said fluid flow straightening means when said retaining means is secured to said fluid flow straightening means;

fastening means securing said retaining means to said fluid flow straightening means by said fastening means abutting the center portion of said retaining means, passing through the aperture in the center portion of said retaining means and engaging the bore means in the central member of said fluid flow straightening means

whereby both longitudinal and rotational movement of said fluid flow straightening means in said hollow housing is prevented by said retaining means engaging said hollow housing and substantially conforming to a portion of the exterior surface of said fluid flow straightening means when said retaining means is secured to said fluid flow straightening means by said fastening means.

4,189,942
TEMPERATURE INDICATING DEVICE USING A PRESSURE SENSITIVE POLYISOBUTYLENE ADHESIVE SEAL

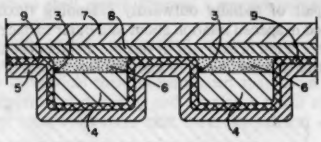
Egenius A. Giezen, Rheden; Gerrit D. B. van Houwelingen, Otterlo, and Mariëtta Cramer, Arnhem, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 13, 1978, Ser. No. 896,114
Claims priority, application Netherlands, May 2, 1977, 7704765
Int. Cl.[2] G01K *11/08, 11/12;* B32B *3/26*
U.S. Cl. 73—356 23 Claims

1. A temperature indicating device comprising

(a) a thermally conductive foil as a carrier layer provided with one or more cavities formed by depressions in the foil material, at least one of which depressions is filled with a solid mixture which melts at a predetermined temperature and includes ortho-chloronitrobenzene, ortho-bromonitrobenzene and a dyestuff, and

(b) a transparent cover layer sealing said cavities and their

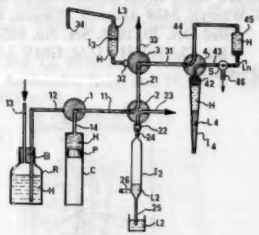


contents, characterized in that said transparent cover layer and said carrier layer are bonded to each other by means of an adhesive layer of a pressure-sensitive adhesive, said adhesive being substantially polyisobutylene.

4,189,943
APPARATUS FOR VOLUME MEASUREMENT OF LIQUIDS

Jean M. Faure, 28 Avenue Aristide Briand, Savigny sur Orge, 91600, France

Continuation-in-part of Ser. No. 670,236, Mar. 25, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 842,032
Claims priority, application France, Mar. 25, 1975, 75 09286; Jul. 30, 1975, 75 23833
Int. Cl.[2] B01H *3/02*
U.S. Cl. 73—425.6 10 Claims



1. An apparatus for transferring a liquid in one or more successive volumes and immediately reusable for transferring another different liquid, said apparatus comprising first means for containing a liquid to be transferred, second means for bringing said liquid into position in said first means, a single control liquid immiscible with said liquid to be transferred and forming a liquid piston to distribute said liquid, wherein said liquid piston contacts said liquid to be transferred without a dead air volume therebetween, and wherein said liquid to be transferred is not contaminated by a previously dispensed liquid, and wherein said first means comprises a containing element made of a material not wettable by said liquid to be transferred or by said control liquid.

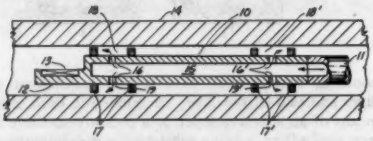
4,189,944
HYDRODYNAMIC ULTRASONIC PROBE

Robert A. Day, Livermore, and Armond E. Conti, San Jose, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,620
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—623 3 Claims

1. In an ultrasonic unit for inspecting an elongated hollow workpiece for wall thickness and flaws, the improvement comprising a hydrodynamic probe; said probe comprising a longitudinally extending cylindrical body member having a cavity extending longitudinally therein and adapted to be

connected with an associated pressurized fluid source, said body member being provided with a plurality of sets of longitudinally spaced holes defining fluid passages between said cavity and an outer surface of said body member, and at least two pair of radially outwardly extending flexible members secured in spaced relation about said outer surface of said body member, each of said pair of flexible members being positioned such that at least one set of said plurality of sets of spaced holes



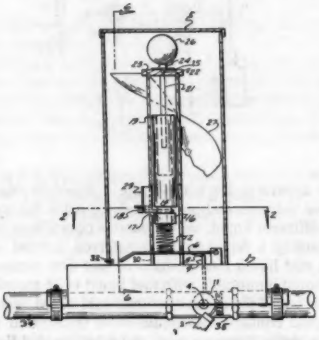
is located therebetween with respect to said outer surface of said body member, each pair of flexible members defining an annulus therebetween, whereby when said body member is inserted into an associated hollow workpiece to be inspected and fluid under pressure is directed into said cavity and outwardly through said spaced holes, each of said annulus functions as a fluid pressure plenum with respect to such an associated workpiece to maintain said body member centrally located within such an associated workpiece.

4,189,945

SEISMIC RESPONSIVE OPERATING DEVICE

Sheldon G. Whiting, 3488 Albee St., Eureka, Calif. 95501

Filed Oct. 30, 1978, Ser. No. 955,636
Int. Cl.[2] H01H *35/14*; G01V *1/16*
U.S. Cl. 73—652 **8 Claims**



1. In a safety device automatically operated by vibration, the combination with a support,

an actuating handle pivoted on the support and being connectable to a device to be actuated,

a column on said support,

a seat on the top of the column for a spherical ball,

a device for controlling said actuating handle including

a releasable holding element on the support,

coacting members on said releasable holding element and on said actuating handle for restraining said actuating handle in inoperative position,

resiliently compressible restraining means related to said column bearing on said releasable holding element to hold it in restraining position.

cocking means related to said column to cock said resiliently compressible restraining means in compressed position,

a catch member engaging said cocking means to hold it in cocked position,

a spiral guide around said column in operative relation to said column to receive and guide said spherical ball when dislodged by vibration,

an abutment member being in the path of said spherical ball on said spiral guide to be abutted by said ball and related to said catch member to move it out of engagement from said cocking means thereby to permit said resiliently compressed restraining means to cause said coacting members to move said holding element out of restraining position and free said actuating handle for actuation,

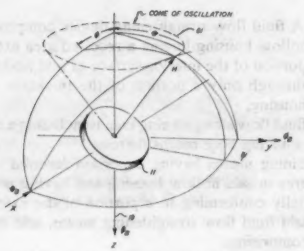
and means to urge said actuating handle into actuating position when freed.

4,189,946

THREE AXIS GYRO

Jay Hoffman, Livingston, and Lincoln S. Ferriss, Lincoln Park, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 16, 1977, Ser. No. 851,942
Int. Cl.[2] G01C *19/28, 19/30*
U.S. Cl. 74—5.4 **11 Claims**



1. In a gyroscope including a rotor spinning about a spin axis, said rotor gimbaled about two mutually perpendicular axes so as to provide rate information along two axes, a method of also causing said gyro to provide rate information about its blind, spin axis comprising:

(a) causing the gyroscope spin axis to nutate in a cone about its nominal, blind, spin axis at a controlled amplitude and at a frequency which is at least close to the natural nutation frequency of the gyro; and

(b) detecting any variation in at least one of the coning parameters of amplitude and frequency to thereby obtain a measure of the rate about said blind axes.

4. In a gyroscope including a rotor spinning about a spin axis, said rotor gimballed about two mutually perpendicular X and Y axes, and cross coupled closed loops operative on said two mutually perpendicular axes so as to provide rate information about said two axes the improvement comprising:

(a) means to cause the gyroscope spin axis to nutate in a cone about its nominal, blind spin axes at a controlled amplitude and at a frequency which is at least close to the natural nutation frequency of the gyro; and

(b) means to detect any variation in the nutation about said spin axes to thereby obtain a measure of the rate about said spin axes.

4,189,947

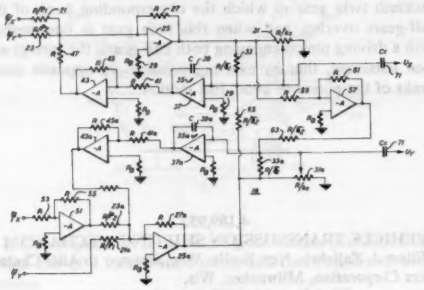
NUTATION DAMPER FOR TWO-AXIS GYROSCOPE

Bernard Friedland, West Orange, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Nov. 14, 1977, Ser. No. 850,940
Int. Cl.[2] G01C *19/04*
U.S. Cl. 74—5.5 **8 Claims**

1. In a two-axis gyroscope having mutually perpendicular first and second reference axes, a rotor with a spin axis, a first pickoff which produces a first pickoff signal whose magnitude is proportional to the angle the rotor spin axis makes with respect to the first reference axis, a second pickoff which

produces a second pickoff signal whose magnitude is proportional to the angle the rotor spin axis makes with respect to the second reference axis, a first torquer which produces angular accelerations of the rotor about the first reference axis, a second torquer which produces angular accelerations of the rotor about the second reference axis, and control means for producing first and second torquer control signals from the first and second pickoff signals which control the amount of angular accelerations produced by the first and second torquers, respectively, the improvement comprising: the control means



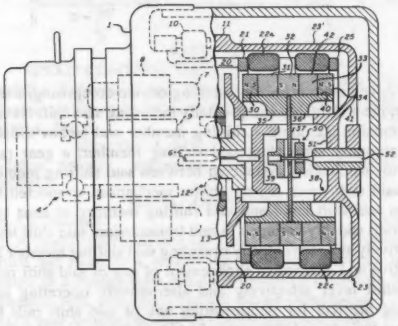
including damping means for stably damping variations in the magnitudes of the first and second pickoff signals occurring at the nutation frequency which damping means use the first and second pickoff signals to produce torquer control signals which cause substantial angular accelerations only when the first and second pickoff signal variations occur at the nutation frequency and which cause no angular accelerations when there are no variations in the magnitudes of the first and second pickoff signals at the nutation frequency; and blocking capacitors disposed between said damping means and the first and second torquers.

4,189,948

PERMANENT MAGNET TORQUER FOR FREE ROTOR FLEXURE SUSPENDED GYROSCOPES

Charles G. Buckley, and James A. Kiedrowski, both of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,486
Int. Cl.[2] G01C *19/30*
U.S. Cl. 74—5.46 **4 Claims**



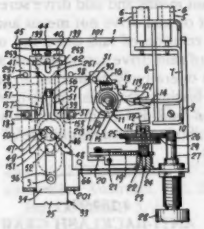
1. In gyroscopic apparatus:
housing means,
drive shaft means journalled in said housing means,
rotor means adapted for spinning about a spin axis by means of said drive shaft means,
means for supporting said rotor means for tilting about first and second tilt axes substantially perpendicular to said spin axis,
inner cylindrical shell means forming a first portion of said rotor means,
outer cylindrical shell means forming a second portion of said rotor means,
primary annular axially magnetized magnet means supported on said rotor means coaxially between said inner and outer cylindrical shell means spaced apart from said outer cylindrical shell means and forming a radial cylindrical gap with respect to said outer cylindrical shell means,
first and second annular magnetizable flux focusing means supported on said rotor means axially adjacent said primary magnet annular means for directing its axial magnetic flux radially across said radial cylindrical gap,
secondary annular axially magnetized means adjacent said first and second annular flux focusing means,
said secondary annular axially magnetized magnet means being polarized so as to oppose the axial flux of said primary annular magnet means for further focusing the flux of said primary annular magnet means radially across said radial cylindrical gap, and
energizable cell assembly means disposed within said radial cylindrical gap for torquing said rotor means with respect to said housing means about said first and second tilt axes in response to tilt thereof.

4,189,949

PUSHBUTTON TUNER

Nardino Righi, and Mario Canni Ferrari, both of Milan, Italy, assignors to Ri-El Ricerche Elettroniche S.p.A., Cologno Monzese, Italy

Filed Jul. 13, 1978, Ser. No. 924,485
Claims priority, application Italy, Jul. 14, 1977, 12691 A/77; May 12, 1978, 12611 A/78
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—10.33 **7 Claims**



1. A pushbutton tuner particularly adapted for automobile radio sets, comprising a plurality of pushbutton assemblies arranged side by side and parallel to each other, each pushbutton assembly being movable in its longitudinal direction and carrying an abutment element which is angularly adjustable around an axis which is perpendicular to the plane of the pushbutton assembly, locking means for locking the said abutment element in a predetermined angular position, said abutment element cooperating with two inclined edges of a V-shaped notch or opening obtained in a control bar slidably arranged transversely with respect to the pushbutton assemblies, said control bar being operatively connected with the tuner group of the radio set, wherein the improvement consists in the fact that the abutment element of each pushbutton assembly comprises at least two abutment members secured onto a common supporting element which is mounted angularly adjustable on the pushbutton assembly, whereby, whenever the pushbutton assembly is pushed to a position for the selection of the desired frequency, firstly one of the said abutment members abuts against one of the two inclined edges of the said V-shaped notch of the control bar, and promotes the shifting of the said control bar in its longitudinal direction, until the other

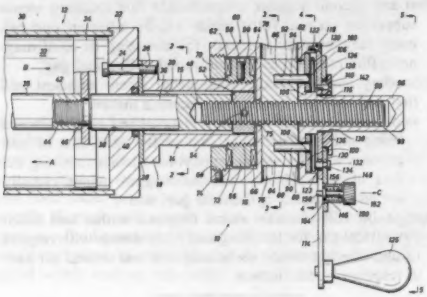
one of the said abutment members abuts against the other one of the inclined edges of the said V-shaped notch.

4,189,950

MANUAL CONTROL APPARATUS

Henry R. Killian, Sugarland, Tex., assignor to Keystone International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 712,371, Aug. 9, 1976, Pat. No. 4,080,844. This application Feb. 13, 1978, Ser. No. 877,689
Int. Cl.[2] F16H *1/18*
U.S. Cl. 74—424.8 A **25 Claims**



1. A selectively engageable manual drive apparatus comprising:

a body having a bore therethrough;

a housing secured to said body and having an axial bore registering with said bore in said body;

rotatable split drive nut means in said housing;

drive screw means mounted for axial movement in said registering bores in said body and said housing;

camming means for selectively engaging and disengaging said drive nut means and said drive screw means whereby engagement of said drive nut means and said drive screw means and rotation of said drive nut means causes axial movement of said drive screw means; and

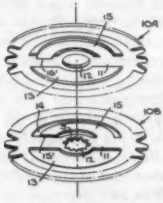
biasing means operatively connected to said split drive nut means, said biasing means serving to exert a biasing engaging force on said drive nut means when said drive nut means encounters a given magnitude of resistance toward engagement.

4,189,951

ANTI-BACKLASH GEAR

Charles A. Sauter, Westbury, N.Y., assignor to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Jun. 27, 1978, Ser. No. 919,542
Int. Cl.[2] F16H *55/18*
U.S. Cl. 74—440 **5 Claims**



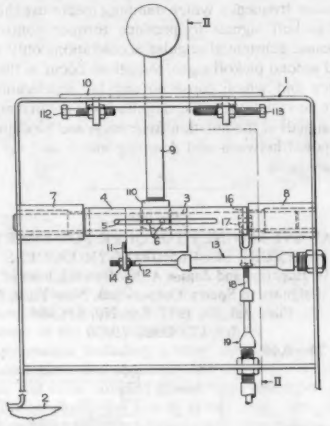
1. An anti-backlash twin gear constituted by a pair of half-gears, each half-gear comprising a toothed wheel stamped out of sheet metal and provided with a diametrical spoke having a center mounting bore, the arched area between one side of the spoke and one half-section of the wheel being fully excised to form an open region, the arched area between the opposite side of the spoke and the other half-section being contour-cut to define a C-shaped untensioned flat spring whose foot is integral with said spoke, the spring having an element at the free end thereof which is offset with respect to the plane of the wheel whereby when a pair of such half gears are juxtaposed so that the offset element of each half-gear is received within the open region of the other and abuts the edge of the spoke forming this region, the two half-gears are angularly displaced by the untensioned springs to a predetermined degree to produce an anti-backlash twin gear in which the corresponding teeth of the half-gears overlap, and when this twin gear is intermeshed with a driving pinion engaging both half-gears, the springs are then tensioned, thereby exerting pressure on opposite tooth flanks of the pinion to avoid lost motion.

4,189,952

VEHICLE TRANSMISSION SHIFTING MECHANISM

William J. Zajichek, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 14, 1977, Ser. No. 851,146
Int. Cl.[2] G05G *5/10, 9/16*
U.S. Cl. 74—477 **10 Claims**



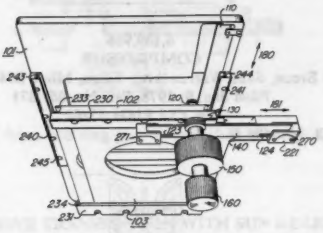
1. A vehicle transmission shifting device comprising, a shift lever, means slidably and pivotally mounting said shift lever, a transmission including a shifting member and means slidably and pivotally supporting said shifting member, a gear ratio selector mechanism connected between said shifting member and said shift lever, a gear shifter mechanism connected between said shift lever and said shifting member, at least two shift rails slidably mounted in said transmission, said shift lever selectively and alternatively operating said shifting member for selective and alternative engagement of one of said shift rails, said shift lever selectively and alternatively operating said shifting member for reciprocating one of said shift rails for shifting the selected gear ratio of said transmission, an interlock mechanism including a camming device connected to said gear shifter mechanism, a plurality of cam followers, a plurality of interlock pins reciprocated by said cam followers in response to the operation of said gear shifter mechanism for selectively locking selected shift rails in the neutral position and in the gear engaging position.

4,189,953

DRIVE SYSTEM FOR MENSURATION STAGES OR THE LIKE

Karl G. Volk, San Jose, Calif., assignor to SemPrex Corporation, Campbell, Calif.

Filed Apr. 15, 1977, Ser. No. 787,884
Int. Cl.[2] B23Q 3/18; G02B 21/26; G05G 11/00
U.S. Cl. 74—479 10 Claims



1. Drive apparatus for translating the sample platform along a first axis of a mensuration stage, said drive apparatus comprising:

an intermediate plate coupled to the sample platform;

a first drive wheel having a grooved tread axially mounted on the intermediate plate of the mensuration stage;

a first drive bar movably mounted along the first axis of the sample platform having a tapered longitudinal edge for frictionally engaging the grooved tread of the drive wheel; and

first manually rotatable control means axially coupled to the first drive wheel for linearly translating the drive bar in response to rotational torque applied to said first control means.

4,189,954

SPEED CONTROL DEVICE FOR A BICYCLE

Yoshihiko Nakamura, and Masashi Nagano, both of Sakai, Japan, assignors to Shimano Industrial Company, Limited, Osaka, Japan

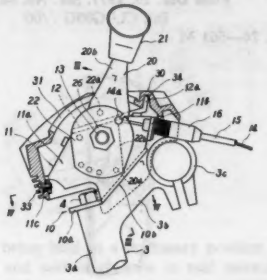
Filed Oct. 4, 1977, Ser. No. 839,457
Claims priority, application Japan, Nov. 4, 1976, 51-149402[U]
Int. Cl.[2] G05G 11/00
U.S. Cl. 74—488 7 Claims

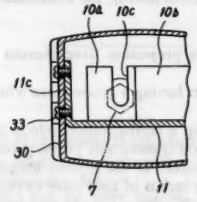
1. A speed control device for a bicycle which is fixable to a handle bar fixed to a handle lug extending from the upper portion of a handle stem which is fixed to a front fork by an expansion bolt, said speed control device comprising:

(a) a base member having an open-ended slot fittable around a stud of said expansion bolt so that said base member is fixed to the uppermost end of said handle stem by tightening said bolt,

(b) a mounting member, fixed to said base member and having a rising higher than the upper surface of said handle stem, and

(c) a speed control lever, rotatably pivoted to said rising through a horizontal pivot so as to be operable in swinging motion above the handle bar longitudinally of the bicycle





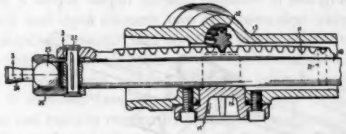
body and positioned substantially above the top of the handle stem.

4,189,955

RACK AND PINION STEERING GEAR FOR AUTOMOTIVE VEHICLES

Arthur E. Bishop, 17 Burton St., Mosman, New South Wales, Australia

Filed Jun. 16, 1975, Ser. No. 587,286
Claims priority, application Australia, Jun. 21, 1974, PB7941
Int. Cl.[2] B62D 5/10
U.S. Cl. 74—498 9 Claims

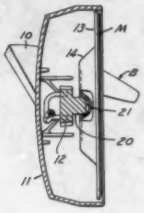


1. A rack and pinion steering gear wherein a pinion is carried on a shaft driving interconnected with a braking device and means whereby, on the application of a road shock force from the rack to the pinion acting to turn the pinion about the axis of the shaft, lost motion of the said shaft is utilized to actuate said braking device to inhibit the rotation of the shaft and thus the transmission of forces from the rack to a steering wheel, means being provided whereby the said braking device is actuated only when the force applied by the rack to the pinion exceeds a predetermined value, further means being provided whereby said braking device is not actuated or is actuated to a reduced extent, by means of forces applied by the pinion to the rack.

4,189,956
REMOTE CONTROL MIRROR

James E. Brubaker, Greenville, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Dec. 19, 1977, Ser. No. 861,835
Int. Cl.[2] G05G 1/00
U.S. Cl. 74—501 M 7 Claims

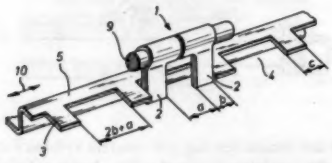


1. In a remote control mirror, the combination comprising
a mirror support,
a base,
said base having a projection fixed thereto and extending therefrom,
said mirror support having a groove into which said projection extends,
said groove having a configuration which is arcuate both longitudinally and transversely of the groove,
the radius of curvature of the groove longitudinally being greater than the radius of curvature of the groove transversely,
said projection having at least two curved contact areas engaging said groove,
said contact areas of the projection having a lesser radius of curvature than the radius of curvature of the groove in a direction transversely of the groove.

4,189,957
ARRANGEMENT FOR ARRESTING A SEAT OF A VEHICLE

Alfred Gedig; Burckhard Becker, and Heinz Bauer, all of Solingen, Fed. Rep. of Germany, assignors to C Rob Hammerstein GmbH, Solingen, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,949
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729770
Int. Cl.[2] G05G 5/06; F16M 13/00; A47C 1/02
U.S. Cl. 74—535 16 Claims

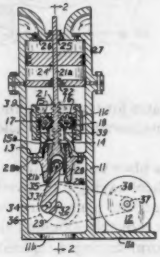


1. An arrangement for arresting a movable member, particularly a seat of a vehicle, comprising an elongated stationary element having a row of separate recesses which correspond to a plurality of possible positions of the movable member; means for arresting the movable member in a desired position and including a mounting member and at least two blocking elements both mounted on said mounting member and movable jointly to a rest position in which the movable member is free to move lengthwise of said row and each being movable independently of the other and relative to said mounting member to an arresting position in which said blocking elements are inserted in respective ones of said recesses independently of one another to thereby prevent further movement of said movable member; and means for actuating said blocking elements so as to displace them independently of one another and relative to said mounting member from said rest position into said arresting position to arrest the movable member, and to alternately displace them jointly from said blocking position into said rest position to thereby set the movable member free to move.

4,189,958
COMPRESSOR

Anton Braun, 6421 Warren Ave., Edina, Minn. 55435

Filed Jan. 9, 1978, Ser. No. 867,871
Int. Cl.[2] F16H 57/02
U.S. Cl. 74—606 R 9 Claims



1. A piston type of compressor comprising a first housing section with a piston therein, a second housing section with spaced side walls and driving means for the piston therein, said driving means including a crankshaft extending through a hole in said second housing, a piston-type of crosshead reciprocable in an axially extending bore in said second housing section and connected to said crankshaft by a connecting rod and operably connected to a piston rod extending from said piston by a balancing mechanism, said balancing mechanism having a portion thereof which moves in the opposite direction to that of said piston and which is constructed and arranged to equalize the masses of the oppositely moving parts of the compressor, said second housing section including a pair of pinions on shafts extending between a pair of generally parallel shaft support means spaced inwardly from side walls of the compressor and substantially equally spaced from the axis of said bore and arranged to enable transversely extending shaft receiving holes to be formed therein when said hole for said crankshaft is formed in a side wall of said second housing section to assure exact parallel arrangement of said shafts and said crankshaft when said compressor is assembled, and means connecting said first and second housing sections together.

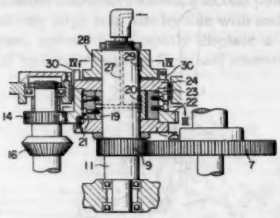
4,189,959
BIDIRECTIONAL DRIVING MECHANISM

Kiyoshi Sawada, Shizuoka, and Katsuo Yamazaki, Numazu, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,670
Claims priority, application Japan, Feb. 17, 1977, 52-16477
Int. Cl.[2] F16H 47/00
U.S. Cl. 74—720 3 Claims

1. In a bidirectional driving mechanism of the type comprising a rack, two pinions meshing with said rack, and gear trains through which power is transmitted respectively to said pinions from a common driving source, the improvement wherein at least one of the gears of said gear train is a ring gear provided on a shaft and a plurality of variable volume oil cham-

bers containing pressurized oil are formed between said ring gear and the shaft of said ring gear so that driving torque is



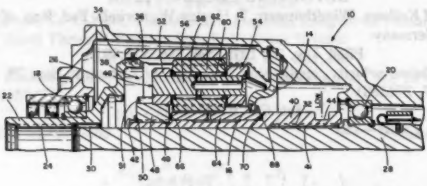
transmitted from said ring gear to said shaft through said oil chambers.

4,189,960

UNDERDRIVE TRANSMISSION WITH SUN GEAR AND CARRIER SLIDABLE AS A SUBASSEMBLY

Holdeman John W., Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 15, 1977, Ser. No. 851,648
Int. Cl.[2] F16H *57/10, 3/44*
U.S. Cl. 74—781 R **4 Claims**



1. A transmission comprising a housing, an input member supported for rotation in siad housing, an output shaft supported for rotation in said housing, and a planetary gear assembly in said housing, said planetary gear assembly including a ring gear secured to said input member for rotation therewith, and a sub-assembly, said sub-assembly including a shift sleeve splined to said output shaft for rotation therewith and sliding movement relative thereto, a sun gear rotatably supported by said shift sleeve, a carrier secured to said shift sleeve for rotation and sliding movement therewith, and a plurality of planet gears rotatably supported by said carrier in mesh with said ring and sun gears, said shift sleeve being slidable to a first position in which said sun gear is engaged with said housing and to a second position in which said carrier is engaged with said input member.

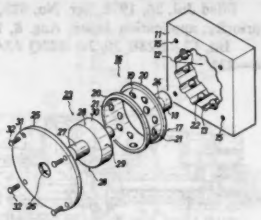
4,189,961

SPEED REDUCTION MEANS

Toshio Yamashita, No. 3-5, Higashi Nihonbashi 2-chome, Chuo-Ku, Tokyo, and Hisashi Kaburagi, No. 3-15, Akabanekita 2-chome, Kita-Ku, Tokyo, both of Japan

Filed Jun. 29, 1977, Ser. No. 810,962
Int. Cl.[2] F16H *13/08*
U.S. Cl. 74—798 **4 Claims**

1. In a speed reduction means, a combination comprising an input rotary body; an output rotary body; a stationary body for supporting said input and output rotary bodies for rotation about a common axis; a primary set of power transmitting balls arranged at regular intervals in two mutually shifted rows forming a zig-zag pattern between said power input rotary body and said power output rotary body; a secondary set of power transmitting balls arranged at regular intervals in a single row between the power output body and said two rows of balls in said primary set; an eccentric portion provided on said power input rotary body for compressing at one point said primary set of balls in radial direction to displace in axial direction said secondary set of balls between said two rows; one of



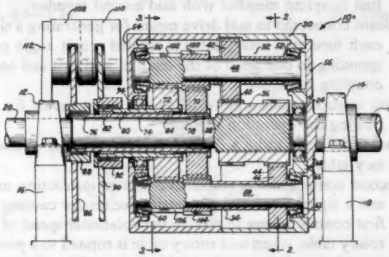
said set of balls being held in a stationary position by said stationary body; and said single row in said secondary set including n balls and each row in said primary set including n+1 balls.

4,189,962

MULTIPLE SPEED GEAR REDUCER

Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Feb. 16, 1977, Ser. No. 769,057
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—802 **6 Claims**

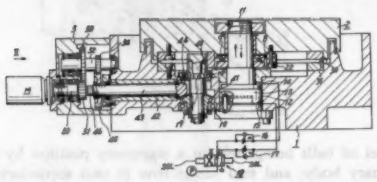


1. A multiple speed gear reducer comprising a torque input element, a torque output element disposed in end-to-end relation with said input element, two gear reduction trains operatively disposed between said input and output elements, means supporting said gear trains for orbital movement about the axis of said input element, a pair of reaction gears at least one of which is disposed concentrically with respect to said input element and radially outwardly therefrom, pinions in said gear trains for each of said reaction gears, first sleeve means disposed concentrically with respect to said input element and connected to one of said reaction gears, second sleeve means disposed coaxially with respect to said first sleeve and connected to the other of said reaction gears, clutch means connected to said sleeves and having rotating means, and means for selectively restraining the rotation of said rotating means to obtain a predetermined gear reduction between said input and output elements, said means supporting said gear trains consisting of a rotatable carrier having end members, said gear trains including shafts parallel with said input element and journaled in said end members, and said output element consisting of a shaft extending axially outwardly from one end of one of said end members.

4,189,963
INDEX APPARATUS FOR ROTARY TABLE

Yoshikazu Sano, Kariya; Kyosuke Haga, Anjo, and Kengo Yoshioka, Kariya, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed Jul. 26, 1978, Ser. No. 928,250
Claims priority, application Japan, Aug. 8, 1977, 52-94868
Int. Cl.[2] B23B *29/24;* B23Q *17/00*
U.S. Cl. 74—821 6 Claims



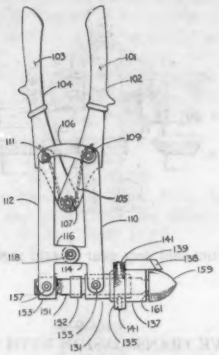
1. An index apparatus for indexing a rotary table comprising:
a base;
a rotary table rotatably and vertically slidably received within said base;
a first annular toothed coupling member secured to said rotary table;
a second annular toothed coupling member engageable with said first annular coupling member and secured to said base;
a hydraulic actuator formed in said base and connected to said rotary table for lifting said rotary table to disengage said first coupling member from said second coupling member to permit rotation of said rotary table relative to said base and for lowering said rotary table to engage said first coupling member with said second member;
means connected to said drive means for generating a signal, each time said rotary table is rotated a unit angle corresponding to one pitch of the teeth of said first and second coupling members;
first control means connected to said drive motor for controlling the operation thereof;
means for instructing a desired angular position of said rotary table;
second control means responsive to said instructing means and a signal from said generating means for causing said first control means to reduce the rotational speed of said rotary table, when said rotary table is rotated to a position spaced a predetermined angular distance from the desired angular position thereof; and
means operated responsive to said second control means for restricting the rotation of said rotary table when said rotary table is rotated to the desired angular position;
said hydraulic actuator being operable to lower said rotary table to engage said first coupling member with said second coupling member, after said restricting means is operated.

4,189,964
DEVICE TO REMOVE CONCENTRIC KNOCKOUTS IN ELECTRICAL APPARATUS

James W. Gray, Tucson, Ariz., assignor to Thomas J. Eaton, Jr., Tucson, Ariz., a part interest

Filed Jun. 16, 1978, Ser. No. 916,110
Int. Cl.[2] B25B *27/00*
U.S. Cl. 81—3 R 10 Claims

1. A device to remove concentric metal knockouts from electrical apparatus comprising handles adapted to open and close about a pivotal point, a first lever operably attached at a first end to one of said handles proximate said handles pivotal point, a second lever operably attached at a first end to the other of said handles proximate said handles pivotal point, said first and second lever operably attached to each other to form

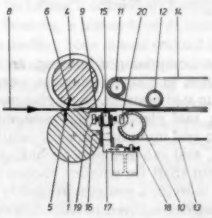


a common fulcrum, and a shearing and punch assembly operably attached to said first and second levers second end.

4,189,965
REVOLVING CROSS CUTTER

Rolf Kollann, Windthorststr. 7, Herlen-Westerholt, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,897
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743801
Int. Cl.[2] B26D *1/40*
U.S. Cl. 83—155 2 Claims



1. A revolving cross cutter for material in web form, comprising two driven knife drums, a transfer table following same in the line of transport of the web, and transport means following the transfer table, means mounting the transfer table for yielding movement in the line of transport comprising spring means and means for adjustably biasing same.

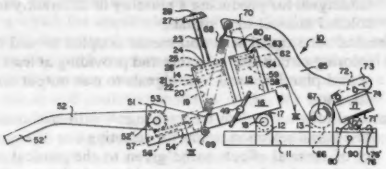
4,189,966
HYDRAULIC HAND TOOL

Ronald E. Keigley, P.O. Box 86, Salem, W. Va. 26436

Filed Apr. 18, 1978, Ser. No. 897,352
Int. Cl.[2] B26D *1/30, 5/12*
U.S. Cl. 83—178 14 Claims

1. A hand tool comprising a base, means on the base interchangeably receiving one of inside and outside cutter members, a cutter member interchangeable on said means, a lever pivoted on said base and having means receiving interchangeably said inside and outside cutter members, resilient means biasing said lever to a normal position in which said outside cutter members are separated and said inside cutter members are joined; pressure responsive means for pivotally moving said lever to effect the cooperative relation of said cutter members; a hydraulic pressure system having a reservoir, a pump

having a piston of relatively small area and conduit means communicating hydraulic pressure created by operation of said pump to said pressure responsive means, a second pump having a piston of relatively large area side by side with said pressure responsive means, operative to rapidly displace a relatively large volume of hydraulic medium from said reservoir to said



pressure responsive means to effect the initial movement of said lever whereby cutting contact of said cutting members with the object to be cut is effected, and carrier means pivoted on said base carrying said pumps and pistons and said pressure responsive means for unitary pivotal movement on said base whereby said pressure responsive means rotates on the base to follow the lever.

4,189,967

SLITTER ROLLERS

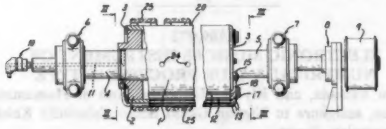
Edward G. Calvert, Flaxbourton, England, assignor to Masson Scott Thrissell Engineering, Ltd., Great Britain

Filed Dec. 16, 1977, Ser. No. 861,242

Claims priority, application United Kingdom, Dec. 30, 1976, 54350/76

Int. Cl.[2] B23D *35/00, 19/04*

U.S. Cl. 83—665 **5 Claims**



1. A roller supporting annular slitter members and having pneumatic tubes in recesses formed in its circumferential surface for holding said members in desired axial positions thereon, in which said recesses and tubes extend lengthwise of the roller and are all located on one side of a plane containing the rotational axis of said roller, and a flat formed on the outer circumferential surface of the roller in a position diametrically opposite the region of said surface containing said grooves and pneumatic tubes.

4,189,968

MOBIUS STRIP BANDSAW BLADE

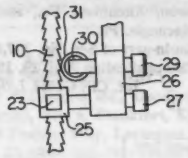
Joseph P. Miranti, Jr., Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Aug. 30, 1978, Ser. No. 938,136

Int. Cl.[2] B23D *55/08;* B27B *13/10*

U.S. Cl. 83—816 **3 Claims**

1. A bandsaw comprising a frame, a lower band wheel mounted for rotation upon said frame, an upper band wheel mounted for rotation upon said frame, a continuous bandsaw blade of Mobius strip construction positioned for movement around said upper band wheel and said lower band wheel, said blade having a knife edge, tensioning means for adjusting said upper band wheel relative to said lower band wheel to adjust the tension in said blade positioned therearound, means for supporting a workpiece to be cut, upper blade guide means and lower blade guide means, wherein each of said blade guide means comprise a thrust bearing mounted for rotation in the cutting plane of said blade, said thrust bearing having a circumferential V-shaped groove, wherein the included angle of said groove is smaller than the angle of said knife edge.



4,189,969

PICKUP UNIT AND PICKUP ASSEMBLY FOR MUSICAL INSTRUMENT

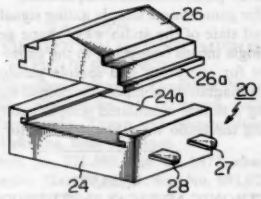
Shinji Katayama, and Kazuo Murakami, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha

Filed Jun. 14, 1977, Ser. No. 806,356

Claims priority, application Japan, Jul. 21, 1976, 51-96063

Int. Cl.[2] G10H *3/00*

U.S. Cl. 84—1.14 **16 Claims**



1. A pickup unit for a musical instrument having tone sources for producing mechanical vibrations, said pickup unit comprising:

a piezoelectric element having opposite responsive surfaces;

a pair of elongated electrode strips, each being arranged in contact with one of said responsive surfaces and each partly projecting out of the contour of said piezoelectric element and each extending to a respective free end;

a unitary molded shield block, made of synthetic resin, internally and wholly confining said piezoelectric element and said electrode strips thereof in such a manner that said free ends of said electrode strips project out of said shield block to form a pair of output terminals of said pickup unit; and

a crest receptive of mechanical vibrations generated by at least one of the tone sources, said crest being disposed atop said shield block in such an arrangement that mechanical vibrations received by said crest are almost all transmitted to said responsive surfaces of said piezoelectric element via said shield block, said crest being releasably coupled to said shield block such that said crest may be removed from said shield block and replaced by a new crest.

4,189,970

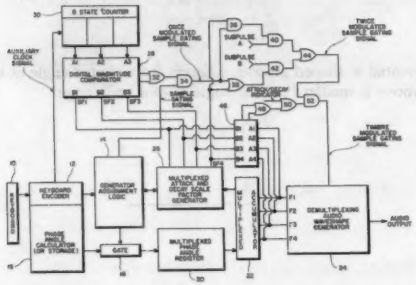
METHOD AND APPARATUS FOR ACHIEVING TIMBRE MODULATION IN AN ELECTRONIC MUSICAL INSTRUMENT

Robert P. Woron, Allentown, Pa., assignor to Allen Organ Company, Macungie, Pa.

Continuation-in-part of Ser. No. 787,695, Apr. 14, 1977, abandoned. This application Aug. 29, 1977, Ser. No. 828,917

Int. Cl.[2] G10H *1/04*

U.S. Cl. 84—1.19 **8 Claims**



1. Apparatus for achieving timbre modulation in an electronic musical instrument including an audio wave shape generator responsive to octavely related note frequency signals, comprising:

means for generating a variable magnitude digital signal,

means connected to the audio wave shape generator for generating octavely related note frequency signals,

digital magnitude comparator means for comparing said variable digital signal with said octavely related note frequency signals and for producing an output signal based on predetermined comparisons,

means for generating a sample gating signal indicative of the desired state of the audio wave shape generator, and

digital logic means connected to the audio wave shape generator for accepting said sample gating signal and said digital magnitude comparator output signal and for producing a timbre modulated sample gating signal for controlling the audio wave shape generator.

4,189,971

ELECTRONIC MUSICAL INSTRUMENT SYSTEM HAVING INDEPENDENT TONE CABINET

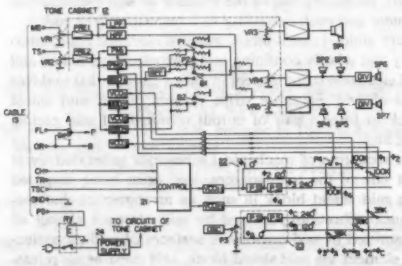
Rokurota Mantani, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 27, 1978, Ser. No. 890,418

Claims priority, application Japan, Apr. 4, 1977, 52-38220

Int. Cl.[2] G10H *1/04*

U.S. Cl. 84—1.24 **14 Claims**



1. An electronic musical system comprising:

an instrument body;

at least one tone cabinet located remote from said instrument body and being separated therefrom; and

means for electrically connecting said instrument body to said at least one tone cabinet;

said instrument body including:

a playing section;

a plurality of tone coloring circuits connected to receive a tone signal for producing a plurality of differently tone-colored musical tone signals;

musical tone signal selection means coupled to said tone coloring circuits for selecting and providing at least one of said plural musical tone signals to one output terminal; and

musical effect selection means ganged with said musical tone signal selection means for selecting one of a plurality of musical effects to be given to the musical tone signal or signals selected by said musical tone signal selection means in accordance with the at least one tone color selected by said musical tone signal selection means; said at least one tone cabinet including:

musical effect imparting circuit means having an input for receiving said selected tone signal or signals and including tone signal modulating means for modulating said selected tone signal or signals in accordance with at least one modulation signal for imparting a selected musical effect or effects to said selected tone signal or signals;

control means coupled to and responsive to said musical effect selection means of said instrument body to set said musical effect imparting circuit means into a state for imparting the musical effect selected by said musical effect selection means to said selected tone signal or signals; and

a sound system having at least one loudspeaker and having an input coupled to the output of said musical effect imparting circuit means.

4,189,972

ELECTRONIC MUSICAL INSTRUMENT OF NUMERICAL VALUE PROCESSING TYPE

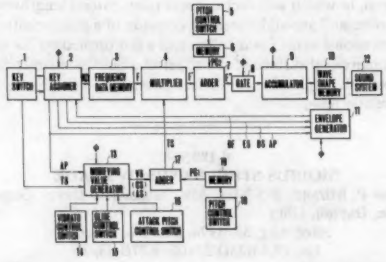
Shigeru Yamada, and Kiyoshi Ichikawa, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 22, 1978, Ser. No. 880,203

Claims priority, application Japan, Feb. 26, 1977, 52-20443

Int. Cl.[2] G10H *1/04, 5/00*

U.S. Cl. 84—1.25 **3 Claims**



1. An electronic musical instrument conprising:

a key switch circuit designating notes to be played by key operation;

a first circuit for generating a numerical value corresponding to a frequency related to a designated not corresponding to an operated key;

a second circuit for modifying said numerical value to produce a modified signal;

a third circuit for producing a musical tone having a frequency corresponding to said modified signal;

a fourth circuit which generates a modification coefficient of said numerical value related to the designated note; and

means for supplying said modification coefficient to said second circuit to modify said numerical value;

said fourth circuit including circuit means responsive to the key operation for generating a periodic signal as said modification coefficient, said circuit means having a circuit for generating said periodic signal including a portion in which the amplitude of said periodic signal increases at a predetermined rate and a succeeding portion in which the amplitude is constant, and means for varying said rate;

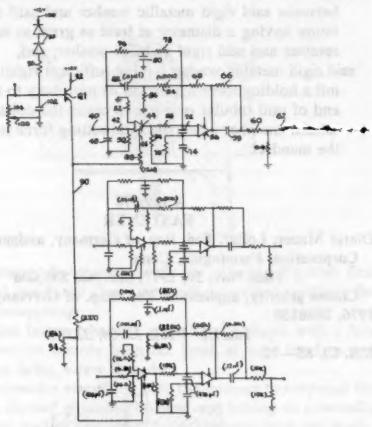
said rate varying means including means for providing a low rate as said predetermined rate so that the increase of said amplitude of the periodic signal takes place gradually enough to be perceived by human ears, means for providing a high rate as said predetermined rate so that said increase takes place too quickly to be perceived by human ears, and means for switching said rates.

4,189,973

ELECTRONIC EXPRESSION CONTROL

Patrick K. Doane, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jul. 8, 1977, Ser. No. 813,834
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.27 **20 Claims**



1. A circuit for effecting expression control in an electronic organ or the like comprising:

variable gain amplifier means having a signal input terminal and a signal output terminal,

said amplifier means having gain control terminal means separate from said input terminals so that signals on said control terminal means are not joined with any signal on said input terminal,

a source of control voltage,

a player controlled circuit connected between said source of control voltage and said control terminal means, said player controlled circuit comprising a transistor connected between said source of voltage and said control terminal means, a potentiometer connected to a control terminal of said transistor, said potentiometer comprising a slider engaging and movable along a resistor element, a high frequency low impedence shunt means including a capacitor, said shunt means being connected to a point between said potentiometer means and said transistor controlled terminal for smoothing out sudden changes in potentiometer output as sensed by said transistor control terminal and for shunting away from said transistor control terminal the high frequency components present in any scratch produced by said potentiometer,

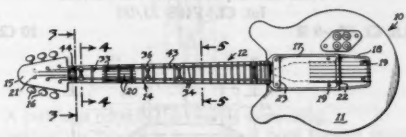
said amplifier means including means associated with said control terminal means for controlling the gain of said amplifier means in response to said control terminal.

4,189,974

GUITAR NECK ASSEMBLY

James O. Martin, 249 Ridgewood Rd., Goodlettsville, Tenn. 37072; Rex D. Fathergill, Rte. 6, Frankfort, Ky. 40601, and David L. Krimm, 286 Tangley Way, Lexington, Ky. 40503

Filed Sep. 22, 1978, Ser. No. 944,927
Int. Cl.[2] G10D *3/06*
U.S. Cl. 84—293 **9 Claims**



1. A neck assembly for a stringed musical instrument comprising:

(a) an elongated, channel-shaped, open-top, neck body, having elongated first and second upper edge portions,

(b) a plurality of elongated fret members having first and second end portions,

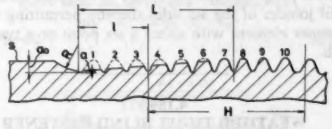
(c) means securing said fret members to said neck body to substantially span the open top of said neck body, so that said fret members are disposed transversely and spaced longitudinally of said neck body and beneath the strings of a stringed musical instrument of which said neck body forms a part.

4,189,975

SCREWED CONNECTION HAVING IMPROVED FATIGUE STRENGTH

Sinichi Nisida, Kitakyushu; Chikayuki Urashima, Nakama, and Hiroki Masumoto, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Nippon Steel Bolten Company Ltd., Fukuoka, both of, Japan

Continuation of Ser. No. 771,386, Feb. 23, 1977, abandoned. This application Mar. 28, 1978, Ser. No. 891,026
Int. Cl.[2] F16B *33/00*
U.S. Cl. 85—1 T **4 Claims**



1. A screwed connection comprising an internal thread member and an external thread member, said external thread member having an axially extending threaded part and a cylindrically shaped unthreaded part having an outside diameter at least equal to the maximum diameter of said threaded part and extending axially from one end of said threaded part, the threaded part of said external thread member being provided with at least one complete thread and a plurality of successive crest-cut-off threads arranged to constitute at least a fraction of the threaded part thereof and having heights of said crest-cut-off threads progressively decreasing from said at least one complete thread in the screwing up direction of said connection to the unthreaded part thereof while maintaining constant the major diameter of the internal thread and the minor diame-

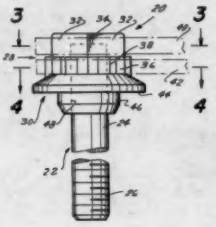
ter of the external thread respectively, the crest-cut-off thread having the least height being located adjacent to the unthreaded part, and an axially extending clearance section of moderate concave curvature extending between the radially outer surface of said crest-cut-off thread having the least height and said unthreaded part and the least diameter of said axially extending clearance section being at least equal to the diameter of the thread root of said axially extending threaded part.

4,189,976

DUAL HEAD FASTENER

Stephen P. Becker, Poughkeepsie, N.Y., assignor to Fargo Manufacturing Company, Inc., Poughkeepsie, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,161
Int. Cl.[2] F16B *23/00*
U.S. Cl. 85—9 R **10 Claims**



1. A fastener element adapted for use as a bolt head, nut and the like comprising; an operative structure adapted for removably interconnecting with at least one other element of a fastener assembly to complete the assembly, a head extending from the operative structure and having an exterior surface adapted to be removably engaged by a tool for rotation of the element, the head being hexagonal in configuration on its outer surface for a predetermined portion of its height and being of a twelve pointed configuration on its outer surface for a predetermined portion of its height thereby permitting the use of a fastener element with a tool adapted for engagement with a six pointed surface or a tool for engagement with a twelve pointed surface, the head being hexagonal in configuration and having a projection extending from each side thereof a predetermined height less than the height of the head and being circumferentially aligned to thereby cooperate with the edges of each adjoining pair of sides to the head to form a twelve point head portion at the location of the projection while retaining a six point head portion at the remainder of the head formed by the point of joinder of the six sides thereby permitting the use of the fastener element with either a six point or a twelve point wrench.

4,189,977

WEATHER TIGHT BLIND FASTENER

Carman R. Hintz, Pittsburgh, Pa., and Warren K. Jahns, Chicago, Ill., assignors to H. K. Porter Company, Inc., Pittsburgh, Pa.

Filed Jan. 6, 1978, Ser. No. 867,463
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—70 **27 Claims**

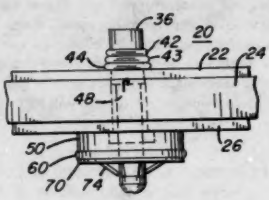
1. A blind weather tight fastener for joining together two or more members having aligned openings formed therethrough comprising:

a tubular member extending through the members to be joined having a flanged end portion which engages the outer member when the blind fastener is inserted through the aligned openings;

a mandrel having a headed portion, defining an annular surface engaging the unflanged end of said tubular member to cause controlled collapsing of the unflanged end of said tubular member when an axial setting force, relative to said tubular member, is applied to said mandrel;

a rigid metallic washer having a thickness greater than the thickness of the flange of said tubular member, having a counterbore formed in the center thereof to receive the flanged end of said tubular member, disposed on said mandrel with the flanged end portion of said tubular member positioned in the counterbore;

a circular retainer, slidable in one direction only, disposed over the end of said mandrel, which projects from the flanged end of said tubular member, to resiliently hold said



mandrel within said tubular member when the fastener is set;

a resilient washer formed of resilient material sandwiched between said rigid metallic washer and said circular retainer having a diameter at least as great as said circular retainer and said rigid metallic washer; and,

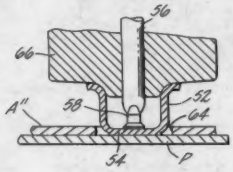
said rigid metallic washer having sufficient rigidity to transmit a holding force applied to its periphery to the flanged end of said tubular member to cause the collapse of said tubular member when the axial setting force is applied to the mandrel.

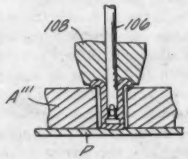
4,189,978

FASTENER

Dieter Mauer, Lollar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Nov. 29, 1977, Ser. No. 855,606
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2656130
Int. Cl.[2] F16B *13/04, 33/04*
U.S. Cl. 85—72 **3 Claims**





1. A fastener for use in securing an article to a support without making a hole in the support comprising a tubular shank of substantially constant outside diameter open at one end, and an

end wall closing said shank at the other, said end wall being weldable to the support or adapted to be bonded thereto, and a pin centrally disposed with respect to said shank, partly accommodated therein and in part projecting therefrom at one end remote from said end wall, said pin having a head accommodated in a recess in said shank adjacent said end wall and being closely surrounded by an intermediate portion of said shank such that said head cannot be retracted relative to said shank without radial expansion of said shank, and a portion of said shank at said open end having a slightly larger internal diameter than said intermediate portion whereby said open end of said shank is disposed in spaced relation with said projecting part of said pin being adapted to be splayed radially outwardly by an anvil bearing thereagainst with a force counterbalancing that of a pull applied to said pin.

4,189,979

FASTENER FOR SECURING AND SEALING SHEET MATERIAL IN SPACED RELATION TO A SUPPORT

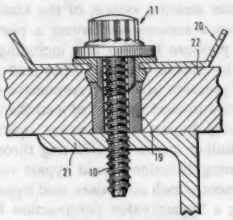
Colin Silverwood, Pudsey, England, assignor to British Screw Company Limited, Leeds, England

Filed Oct. 11, 1977, Ser. No. 840,528

Claims priority, application United Kingdom, Oct. 14, 1976, 42666/76

Int. Cl.² F16B *13/04, 29/00*

U.S. Cl. 85—74 **5 Claims**



1. A threaded fastener assembly for securing together first and second apertured sheet members in spaced relation, the assembly comprising:

a threaded fastener having a head and a shank with a free end portion remote from the head, at least the free end portion being screw threaded;

a rigid expander assembled with the fastener to surround the shank thereof adjacent the head and having an externally tapered lead-in portion at its end remote from the head;

a resilient sealing washer comprising an annular body and an annular external flange at one end of the body, the sealing washer being assembled with the fastener to surround the shank thereof with the flanged end disposed adjacent the rigid expander;

a rigid spacer means surrounding the shank of the fastener and abutting the resilient sealing washer at the end thereof remote from the flange;

the rigid spacer means, the body of the sealing washer and the rigid expander being of such a size as to be capable of passing through the aperture of the first sheet member, the flange of the resilient sealing washer being too large to pass through said aperture, the resilient sealing washer being capable of riding over and being expanded radially outwardly by the rigid expander as the assembly is being secured to said sheets, the resilience of the sealing washer and the dimensions of the sealing washer and expander being so selected in relation to the size of aperture in the first sheet member as to permit the expander to move to a position within the body of the resilient sealing washer and extending through said aperture, whereby the resilient sealing washer is expanded into abutment with both faces of the first sheet member.

4,189,980

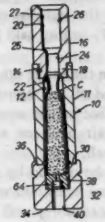
METHOD AND APPARATUS FOR RELOADING A CENTERFIRE CARTRIDGE

Gordon N. Schaenzer, 11737 N. Solar Ave., Mequon, Wis. 53092

Filed Jan. 16, 1978, Ser. No. 869,822

Int. Cl.² F42B *33/00*

U.S. Cl. 86—24 **6 Claims**



1. A cartridge reloading apparatus comprising:

a resizing die having a longitudinal bore formed therein which includes a funnel portion, and a coaxial resizing portion for receiving a used cartridge therein and for reshaping the external configuration of a cartridge driven therein by mechanical force; an anvil for supporting said resizing die, said anvil including a bore therein having a diameter larger than the diameter of said cartridge and for receiving a portion of said cartridge; means for removing the primer from said cartridge by mechanical force and for forcing said cartridge out of said resizing die while said resizing die is seated on said anvil, the removing means being a rod including an end receivable in said cartridge and supporting a pin extending axially from said end for striking said primer; cartridge priming means for forcing a primer into said cartridge; means for flaring the neck opening of said cartridge to form a funnel which cooperates with the funnel portion of said resizing die to facilitate filling said cartridge with gunpowder and to facilitate the insertion of a bullet therein; a bullet seating tool for forcing a bullet into said shell neck; and crimping means for crimping said neck against said bullet.

4,189,981

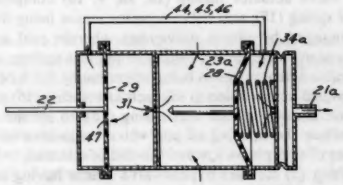
COMBINATION THROTTLE KICKER AND DECELERATION VALVE

George C. Ludwig, Owosso, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Dec. 30, 1977, Ser. No. 865,983

Int. Cl.² F15B *13/042*

U.S. Cl. 91—52 **10 Claims**



1. A combination throttle kicker and deceleration device comprising

a housing,

a wall dividing said housing,

a first diaphragm on one side of said wall forming a chamber with an end of said housing,

said housing having a connection for connecting the cham-

ber between said first diaphragm and said housing to vacuum,

said wall having an opening therein providing communication between the two sides of said wall,

means defining a vent passage from the space between said first diaphragm and said wall to the ambient atmosphere exterior of said housing,

said diaphragm being adapted to engage said wall and prevent the flow of air through the opening in said wall,

spring means yieldingly urging said first diaphragm toward said wall,

a second diaphragm on the other side of said wall forming a chamber with an end of said housing,

means defining an orifice in said second diaphragm providing free access of air between said second diaphragm chamber and said wall,

and a shaft adapted to be moved by said second diaphragm upon movement away from said wall,

said shaft extending exteriorly and being adapted to be linked to a throttle,

and means providing communication between the chambers formed between the diaphragms and the ends of the housing.

4,189,982

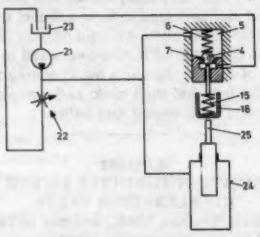
FEED PRESSURE BYPASS VALVING FOR SERVOMOTORS

Armin Lang, Schwabisch Gmund-Bettringen, and Rolf Fassbender, Mutlangen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrickshafen, Fed. Rep. of Germany

Filed Jan. 4, 1977, Ser. No. 756,738

Int. Cl.[2] F15B *15/20*

U.S. Cl. 91—400 **7 Claims**



1. In a feed pressure bypass valve means actuatable by the piston of a servomotor, the improvement comprising a valve (4, 7) and bias spring (6) biasing said valve to closed position; having valve actuator means (15, 16, 9, 10) comprising an actuator spring (15); said valve actuator means being disposed to be engaged by piston movement wherein said actuator spring is compressed in opposition to the bias spring;

said valve actuator means being operative by force of predetermined compression in said actuator spring (15) to overcome the bias of said bias spring (10), to initiate and to continue the opening of said valve responsive to movement of said piston toward the end of a stroke;

a housing (1) for said bypass valve means having support structure (17) for said valve actuator means whereby said bypass valve means effects a unitary device independently mountable;

said housing having an inlet passage means (2) for conducting feed pressure to said valve upstream in the closing direction thereof and having outlet passage means (3) connecting to said valve downstream thereof wherein feed pressure is operative as a bias force in the closing direction of said valve.

4,189,983

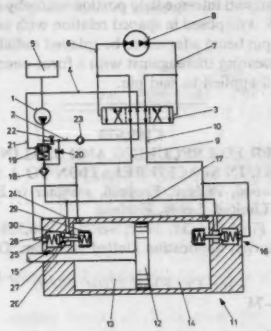
SERVOMOTOR PRESSURE CONTROL RESPONSIVE TO PISTON TRAVEL

Rolf Fassbender, Mutlangen, and Armin Lang, Schwäbisch Gmünd-Bettringen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 4, 1977, Ser. No. 756,794

Int. Cl.[2] F15B *15/22*

U.S. Cl. 91—400 **8 Claims**



1. In a booster steering system of the kind described and which comprises a servomotor having a piston with means effecting feed pressure thereto and including feed pressure bypass means to relieve pressure from said servomotor by bypassing feed pressure to a sump responsive to travel of the servomotor piston toward the end of a stroke and said bypass means comprising bypass valve means operable by piston travel, and including means for effecting throttled feed pressure in the opening direction of said bypass valve means;

the improvement which comprises: said bypass valve means comprising a bypass valve construction having a valve head with a resilient closure bias means and a resilient opening means disposed to be increasingly compressed by piston travel toward the end of a stroke to oppose the resilient closure bias means for effecting gradual opening force on said valve head to the point where said throttled feed pressure can effect opening thereof to prevent abrupt pressure drop in said servomotor by gradually reducing the force needed to overcome the closure bias means.

4,189,984

PISTON-CYLINDER ARRANGEMENT FOR A COMPRESSOR

Hans J. Tankred, Sonderborg, and Erling B. Kristensen, Austenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 18, 1978, Ser. No. 906,958

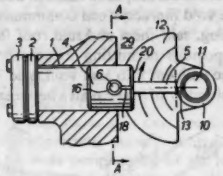
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724332

Int. Cl.[2] F15B *21/04*

U.S. Cl. 92—82 **4 Claims**

1. A compressor assembly, comprising, a casing forming a cylinder and a crankcase, a piston member having no sealing ring, said piston being reciprocally mounted in said cylinder and having a transversely extending bore, a pin member in said bore having a length which is shorter than the diameter of said cylinder so as to define recesses at opposite ends thereof, a crankshaft in said crankcase, a crank extending between and connected at opposite ends thereof to said pin member and to said crankshaft, said piston member having a stroke relative to said cylinder so that said recesses extend beyond the lower edge of said cylinder when said piston member is at the bottom

of its stroke, throttle passage means in at least one of said members providing fluid communication between said recesses



and the interior of said crankcase when said recesses are entirely above the lower edge of said cylinder.

4,189,985

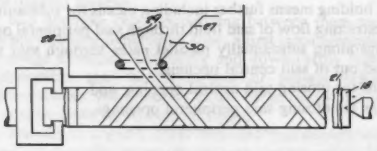
FABRIC-LINED EPOXY RESIN CYLINDER WITH LUBRICANT RETAINING GROOVES

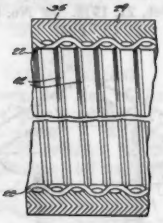
Bernard Harris, Bayside, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Dec. 21, 1977, Ser. No. 862,808

Int. Cl.[2] B32B *1/08, 1/10;* **B65H** *81/06;* **F01B** *11/00;* **F16L** *9/16*

U.S. Cl. 92—153 **8 Claims**





1. A fluid actuated device comprising a wound glass filament reinforced resin bodied cylinder and a piston axially movable in the cylinder by a fluid under pressure, said cylinder having an axially extending series of circumferential grooves and lands which form the inner surface thereof, said lands providing the support of the piston against radial loads and said grooves providing recesses for retaining portions of the fluid as a lubricant, said cylinder further including a fabric embedded in the resin and having relatively uncrimped circumferential filling yarns and axial warp yarns, said lands including the radially inward crimps of the warp yarns, said grooves being formed by capillary action adjacent the crimps of the warp yarns, said fabric being in the form of a seamless woven sleeve having a continuous filling yarn and in the order of 80 warp yarns per inch, said grooves and lands being of spiral form.

4. A cylinder in which a piston may be disposed for axial movement by a fluid under pressure within the cylinder and having an axially extending series of voids which appear as circumferential grooves between lands which form the inner surface of the cylinder, said lands providing support of the piston against radial loads and said grooves providing recesses for retaining portions of the fluid as a lubricant, said cylinder comprising a resin body and a fabric embedded therein and having circumferential filling yarns and axial warp yarns, said lands including the radially inner crimps of the warp yarns, said grooves overlying the intersections of the warp yarns, said fabric being in the form of a seamless woven sleeve having a continuous filling yarn such that the grooves comprise a single, spiral groove.

7. The method of making a glass filament reinforced resin bodied cylinder in which a piston may be disposed for axial movement by a gas under pressure within the cylinder and having an apparently axially extending series of circumferential grooves and lands which form the inner surface of the cylinder, said lands being provided for the support of the piston against radial loads and said grooves providing recesses for retaining gas-borne fluid as a lubricant for the lands, said method comprising (1) providing a seamless fabric sleeve of yarns of a 1×1 weave consisting of a continuous relatively uncrimped circumferential filling yarn and relatively larger lengthwise warp yarns of nominal twist, (2) providing a rigid, smooth cylindrical mandrel with a non-wettable outer coating, (3) circumferentially fitting said sleeve on said mandrel whereby the inner crimps of the warp yarns are pressed against and conform closely to the mandrel, (4) applying a thermosetting resin over the outer face of the sleeve and winding a series of helical glass filaments in several layers thereover such that while the resin generally soaks readily through the yarns to the face of the mandrel the surface tension of the resin causes the formation of a minute voids at the apices between the mandrel and the radially inner crimps of the warp yarns and causes the resin to form a generally spiral groove at the surface of the mandrel, (5) curing the resin while the cylinder is on the mandrel and thereafter (6) removing the cylinder from the mandrel, said groove then constituting said lubricant grooves intermediate said lands.

4,189,986

METHOD AND APPARATUS FOR HEAT SEALING A PACKAGE BLANK

Stanley M. Silver, London, England, assignor to Paxall Inc., Chicago, Ill.

Continuation of Ser. No. 830,102, Sep. 2, 1977, abandoned, which is a division of Ser. No. 234,105, Mar. 13, 1972, Pat. No. 4,046,308. This application Aug. 3, 1978, Ser. No. 930,517

Claims priority, application United Kingdom, Mar. 24, 1971, 7709/71; Apr. 21, 1971, 10351/71; Apr. 21, 1971, 10352/71; Jun. 9, 1971, 19550/71

Int. Cl.[2] B65B *1/02*

U.S. Cl. 93—36 M **10 Claims**

1. A method of end-sealing a blank with heat-sealable characteristics suitable for packaging, said blank being formed from a sheet of laminated material comprising a substratum and sheeting of pack-lining material delaminably adhered to the substratum by a moisture-resistant heat-weakenable laminant, and said sheeting surface having pressure-cohesive characteristics when heated; said blank having fold lines defining at least two pairs of opposable body walls and at least one foldable end closure panel connected to each body wall end, and at select opposable edge margin areas of the blank, fold lines defining flange panels, at least one of which flange panels has an extension and at least one of which flange panels is connected to a body wall, the aggregate of said flange panels and extension being of greater length than the edge of said body wall parallel thereto, and said flange panels being sufficiently cut free on three edges and being co-operable to permit folding into a sealable side fin; and said end closure including a main closure

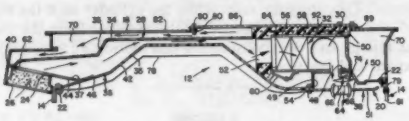
panel, lateral gussets and a flange closure panel at least almost wholly cleanly laterally severed therefrom for forming a heat-sealed joint co-extensive with the gussets at the corners of an erect package; said method including the steps of folding the said blank such as to bring the roots of said fin flange panels into interengagement, subjecting superposed body walls to pressure contact, applying heat and pressure to at least said roots to cause their sheeting to fuse, heating and outfolding one fin flange panel and an adjacent panel to strip the sheeting therefrom, folding and adhering regions of the stripped substratum to at least one opposed panel thereby to define a substratum tube around a sheeting tube; downfolding the main closure panel with outfolding of the gussets and outfolding of the flange closure panel, applying heat and pressure to at least partly seal the sheeting thereof and so define an at least partially sealed end membrane, lifting the said main closure panel to strip it from the said end membrane, infolding the gussets, downfolding the stripped main closure panel and sealing down the said folded-down main closure panel.

4,189,987

VEHICLE CAB TEMPERATURE CONTROL SYSTEM

Arthur A. Amberg, Plainfield, and Ture R. Zetterlund, Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jul. 3, 1978, Ser. No. 921,384
Int. Cl.[2] B60H *1/24*
U.S. Cl. 98—2.14 **6 Claims**



1. In a vehicle cab air temperature control system for a cab having an operator enclosure with a roof and an outwardly exposed air filter means attached to the roof of said operator enclosure, the improvement including, in combination:

a duct secured within said operator enclosure in close proximity below and in spaced relationship to said roof, thereby providing an insulating chamber containing trapped air between substantially the entire expanse of said roof and said duct, said duct is secured to said air filter means and has an inlet aperture adjacent said air filter means within said enclosure to provide an air passage between said duct and said air filter means, an outlet aperture spaced from said inlet aperture to provide an air passage between said duct and said enclosure and a bleed aperture located between said inlet and said outlet apertures to provide an air passage between said duct and said chamber;

blower means mounted within said duct for supplying a flow of air from outside said air filter means through said air filter means, said inlet aperture, said duct, into said operator enclosure through said outlet aperture and into said chamber through said bleed aperture; and

temperature control means mounted within said duct between said bleed aperture and said inlet aperture for controlling the temperature of the air flowing from said duct into said operator enclosure and said chamber.

4,189,988

INSULATION AND VENTILATION SYSTEM FOR MOBILE HOMES

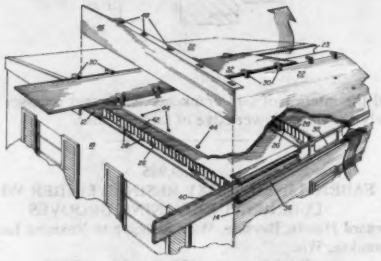
Noah Shaver, 32 W. Harvard St., Orlando, Fla. 32804

Filed Jan. 16, 1978, Ser. No. 869,537
Int. Cl.[2] F24F *7/02*
U.S. Cl. 98—31 **8 Claims**

1. A system for use with a conventional building having an existing roof, said system comprising:

a flexible sheet having dimensions generally conforming to said roof, said sheet including a central opening extending along said sheet parallel with a first edge of said roof;

means for conforming said sheet to the pitch of said roof and for holding said sheet in spaced relation above said roof so as to define a void therebetween communicating with said central opening, said sheet and said roof further defining peripheral openings permitting movement of a cooling fluid from the ambient into said void, said holding means including a plurality of brace plates between said roof and



said sheet and normal to said first edge, each plate having plural slots therein extending from said sheet toward said roof;

said holding means further including means for substantially restricting flow of said fluid through said peripheral openings along substantially parallel paths through said void and out of said central opening;

means for closing said central opening; and

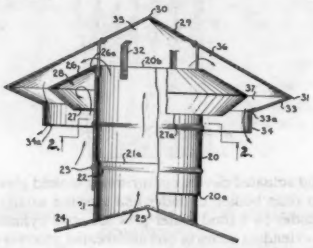
means for closing said peripheral openings.

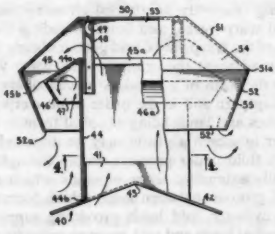
4,189,989

GABLE VENTILATORS

Perry V. Maze, 701 Morton, Falls City, Nebr. 68355

Filed Feb. 21, 1978, Ser. No. 879,762
Int. Cl.[2] F24F *7/02*
U.S. Cl. 98—42 R **15 Claims**





1. A ventilator construction comprising, in combination,

a normally vertical, hollow centered stack for flowing air or gas therethrough,

said stack made up of a continuous, enclosing wall having upper and lower ends both open,

the lower end of the stack adapted to be put into communication with an opening in the roof of a housing structure to receive air or gas flow therefrom,

the upper end of the stack adapted to discharge the said air or gas upwardly therefrom,

a first hoodlike canopy overlying and partially enclosing the upper end of said stack, said first hoodlike canopy made up of a first uppermost portion centrally overlying the stack and, at least peripherally of the stack upper end, angling outwardly and downwardly, the outermost portion of the first hoodlike canopy extending downwardly and inwardly past the upper edge of said stack,

a second, inboard hoodlike canopy surrounding the stack adjacent the upper end of the stack and circumferentially connected thereto,

said inboard second hoodlike canopy having an upper portion extending circumferentially outwardly and slightly downwardly from its connection to the stack peripherally and circumferentially thereof, with a lower portion of said second hoodlike canopy extending downwardly and inwardly toward the periphery of the stack from the periphery of the first portion thereof,

the inboard hoodlike canopy defining a dead air capture space closely adjacent the top of the stack but immediately peripheral thereto,

the two hoodlike canopies defining between them and the stack a central plenumlike zone, a first circumferential air passage extending outwardly and downwardly from the plenumlike zone and a further air passage extending downwardly and inwardly to discharge below the lowermost portions of the two canopies,

the lowermost portion of the outboard first canopy extending substantially below the inboard second canopy lowermost portion circumferentially thereof, and

means connecting each of the said hoodlike canopies to the upper end portion of said stack.

4,189,990

FALSE CEILING

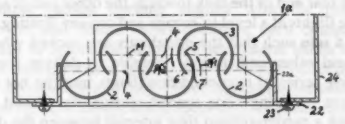
Helmut Kittler, Freiburg, Fed. Rep. of Germany, assignor to GIF Gesellschaft fur Ingenieurprojekte Freiburg mbH, Freiburg, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,491

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718611

Int. Cl.² F24F *13/08*

U.S. Cl. 98—121 R **32 Claims**



1. An air-permeable barrier, particularly a false ceiling or grate for interception of solid and/or liquid constituents of ascending air, comprising a plurality of parallel, substantially horizontal and substantially trough-shaped neighboring slats each bounding an internal space of a predetermined width and including two elongated marginal portions each having a marginal edge, said marginal edges flanking a substantially longitudinally extending opening and being spaced apart by less than said predetermined width as considered across said opening, the opening of one slat of each pair of neighboring slats facing substantially upwardly and the opening of the other slat of each pair of neighboring slats facing substantially downwardly, one marginal portion of one slat of each pair of neighboring slats extending with clearance through said opening and into said internal space of the other slat of the respective pair and vice versa, said marginal portions of each pair of neighboring slats cooperating with one another to define a respective passage through which air can flow between the upper side and the underside of the barrier said passages having flow-through cross-sectional areas which are narrower at, and wider at a distance from, the respective marginal edges of at least one of said cooperating marginal portions of the respective pair of neighboring slats.

4,189,991

PRESSURIZED FLUID SUPPLY AND CONTROL DEVICE, PARTICULARLY FOR COFFEE-MAKING MACHINES

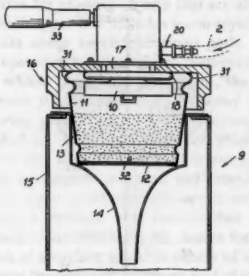
Adrien Haddad, Neve-Avivim, Israel, assignor to Officine Cimbali Giuseppe S.p.A., Binasco, Italy

Filed Apr. 13, 1978, Ser. No. 895,997

Claims priority, application Italy, Apr. 18, 1977, 22543 A77

Int. Cl.² A47J *31/34*

U.S. Cl. 99—302 R **9 Claims**



1. A device for supplying pressurized liquid, particularly in a coffee-making machine, comprising means for generating said pressurized liquid, a bowl for receiving said pressurized liquid, a charge of powdered material, particularly ground coffee, in said bowl, means for supplying said pressurized liquid to said charge in said bowl, means for holding said bowl air-tight closed during the supply of said pressurized liquid and for venting said bowl to atmosphere when the supply of said pressurized liquid ceases, and means for causing said pressurized liquid to be supplied intermittently from said means for generating said pressurized liquid to said bowl and for causing repetition of a number of alternate supply and venting cycles for said bowl.

4,189,992

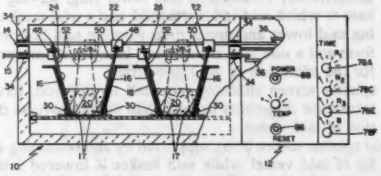
BREAD BAKING

John D. A. Barry, 115 Hazelwood Ave., San Francisco, Calif. 94133

Filed Jan. 15, 1979, Ser. No. 3,227

Int. Cl.² A47J *27/62*

U.S. Cl. 99—327 **12 Claims**



1. A bread baker including;

an oven;

a pair of plates within said oven and arranged to be positioned within a baking pan on opposite sides of a quantity of bread dough within said pan;

a driver engaging said plates and arranged to move said plates towards and away from each other to squeeze the bread dough between the plates; and,

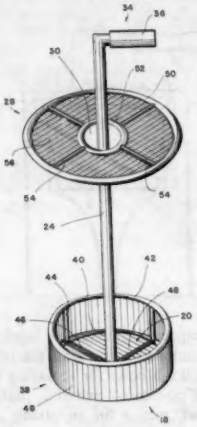
a controller coupled with said driver and with means for heating said oven, and arranged to activate said driver to squeeze said bread dough at a first predetermined time following a first predetermined time interval, and to activate a selected one of said driver and said means for heating said oven following a second predetermined time interval subsequent to said first predetermined period of time and time interval.

4,189,993

OIL SPLATTER SCREEN FOR A DEEP FAT FRYER

Joseph R. Kaufman, 1331 Oakbrook Dr., Largo, Fla. 33540

Filed Feb. 3, 1978, Ser. No. 874,811
Int. Cl.² A47J 37/12
U.S. Cl. 99—403 **5 Claims**



1. A food carrying device for a deep fat frying vessel having a bottom and side walls forming a cavity with a transverse inner dimension and depth and an upper lip at the top opening, with cooking oil in the bottom thereof, comprising:

a food basket having a bottom platform for supporting food to be fried, having a transverse dimension less than said transverse dimension of said vessel;

a rod mounted to said bottom platform and projecting upwardly therefrom, having a vertical dimension greater than said depth of said vessel, for supporting said basket while being lowered into said vessel;

said food basket further comprising lower and upper rings of wire each having a transverse dimension less than said transverse dimension of said vessel, coaxially mounted in spaced, horizontal planes by a support wire vertically mounted to said lower and upper rings; a transverse wire diametrically mounted to said lower ring, serving as the base to which said rod is attached; and a wire mesh covering said lower and upper rings forming said bottom platform and a side wall of said food basket with an open top for the admission of food to be fried;

a splatter screen slideably mounted to said rod, having a transverse dimension greater than said transverse dimension of said vessel;

said splatter screen being supported by and remaining at said lip of said vessel while said basket is lowered into said cavity of said vessel by means of said rod sliding past said screen;

said splatter screen further comprising an outer ring of wire having a transverse dimension greater than said transverse dimension of said vessel; an inner ring of wire having a transverse dimension greater than the cross-sectional dimension of said rod; a radial wire mounted to and supporting said inner and outer rings in coplanar, coaxial relationship; and a screen covering said inner and outer rings, with an opening in the screen within said inner ring to admit said rod;

said wire mesh of said basket having larger openings therein than the openings in said screen of said splatter screen, to permit cooking oil to drain through said basket;

said screen being composed of a wire mesh having a mesh size in the range of from 8 mesh to number 50 mesh, to permit the interception of oil droplets splattered from the cavity of said vessel;

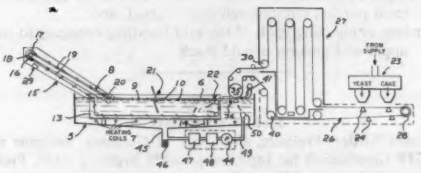
whereby hot cooking oil splattered from the cavity of said vessel will be caught by said screen at the lip of the vessel.

4,189,994

METHOD AND APPARATUS FOR USE IN FRYING DOUGHNUTS

Richard W. Schmader, 50 Myopia Rd., Winchester, Mass. 01890

Filed Apr. 3, 1978, Ser. No. 893,058
Int. Cl.² A47J 37/12
U.S. Cl. 99—405 **10 Claims**

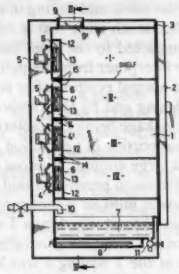


1. Apparatus for use in frying doughnuts, said apparatus including a tank for a predetermined volume of hot oil, an endless conveyor within said tank and extending lengthwise thereof and including transverse flights, the upper course of said conveyor traveling from a transverse pickup zone adjacent the rear end of the tank towards the other end of said tank with the flights at a level to engage and convey floating doughnuts at a rate such that the doughnuts are cooked when they reach said other end, means operable to deliver successive transverse series of uncooked doughnuts into the hot oil in a transverse receiving zone spaced rearwardly of said pickup zone with a predetermined time interval between the delivery of each series, the spacing of the conveyor flights related to said interval to render each flight operable to engage a series of doughnuts at the pickup zone, and means establishing at least one fluid stream operable to carry doughnuts from the receiving zone into said pickup zone at a rate such that the interval between the depositing of successive series may closely approach the rate at which the deposited doughnuts rise, said means including means operable to withdraw hot oil from the tank forwardly of the pickup zone and discharge it in said rear end in the form of a transverse series of jets directed to establish a curtain-like stream flowing upwardly through said receiving zone and forwardly into said pickup zone and operable to convey all the doughnuts of each delivered series away from the receiving zone during said interval.

4,189,995
APPARATUS FOR HEATING FOOD

Alfred Löhr, Bochum; Günter Winterhoff, Dortmund, and Wolfgang Tschek, Seiwerath, all of Fed. Rep. of Germany, assignors to Kuppersbusch Aktiengesellschaft, Gelsenkirchen, Fed. Rep. of Germany

Filed Aug. 24, 1978, Ser. No. 936,520
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739198
Int. Cl.² F24H 3/04
U.S. Cl. 99—447 2 Claims



1. In an apparatus for heating food including a treating chamber; a plurality of horizontally oriented, vertically spaced, superposed shelves dividing the treating chamber into compartments and serving for the support of the food to be heated; a plurality of blowers arranged in the treating chamber; and separate heating elements associated with each of the blowers for generating hot air currents; the improvement wherein all said blowers are arranged in a vertically spaced, superposed relationship at one side of said treating chamber; each said compartment having a separate one of said blowers in alignment therewith; the improvement further comprising

(a) means defining vertically oriented lateral shafts in said one side of said treating chamber;

(b) a detachable hood arranged at each blower and having a central suction opening aligned with the respective blower and lateral outlet openings; each compartment being in communication with said lateral shafts through the central suction opening and the lateral outlet openings of the respective hood for directing the air currents generated by each blower towards another, opposite side of said treating chamber;

(c) means for driving said blowers independently from one another and with different rpm's;

(d) a bottom zone forming part of said treating chamber and communicating with said lateral shafts;

(e) a basin provided in said bottom zone of said treating chamber;

(f) means for filling said basin with water;

(g) means for draining said basin;

(h) an electric heater arranged in said basin for heating the water contained therein;

(i) a top side forming part of said treating chamber;

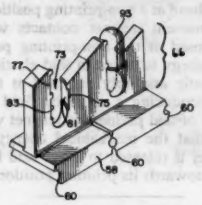
(j) means defining an opening in said top side; and

(k) a movable throttle flap disposed in said opening for controlling the cross-sectional flow passage area thereof.

4,189,996
CONVEYOR LINK AND CAPSULE GUIDE FOR PRINTERS

Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R.W. Hartnett Company, Philadelphia, Pa.

Filed Dec. 12, 1977, Ser. No. 859,303
Int. Cl.² B41F 17/36
U.S. Cl. 101—37 5 Claims

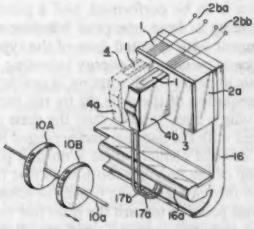


1. In apparatus for printing objects that are all similar in size and shape, which apparatus includes a conveyor for transporting said objects along a predetermined path, hopper means located at an upstream location of said conveyor and including a discharge which feeds said conveyor, the improvement which comprises the combination of carrier means on said conveyor having pocket means therein arranged to receive objects fed thereto, means operable for printing upon said objects as they are advanced by said conveyor, including a guide member stationarily mounted and extending along one side of said conveyor proximate said carrier means, said guide member having a recessed area thereof that extends in the direction of said predetermined path, means for operating said printing means at a surface speed in excess of the linear speed of said conveyor thereby to rotate each said object as it is being printed, and means for ejecting said objects from said carriers downstream from said printing means, said pocket means comprising a pair of upstanding wall members defining beveled surfaces to facilitate in ejection of said objects therefrom, each wall being provided with a recessed relief portion aligned with said guide member recessed area and extending about said pocket and spacing a portion of said pocket from said object so that indicia printed on the object in the area proximate said relief area are not smeared on said pocket or said guide member during printing.

4,189,997
PRINTER

Mineo Nozaki, and Mitsuaki Seki, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 757,287, Jan. 6, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,721
Claims priority, application Japan, Jan. 16, 1976, 51-3885
Int. Cl.² B41J 9/02
U.S. Cl. 101—93.09 11 Claims



1. A printer comprising:

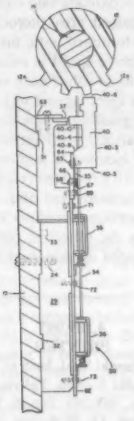
a type member including a plurality of type characters, said type member comprising a non-magnetic material;
ink supplying means for supplying ink to said type member;
a hammer head arranged to move against selected ones of the plurality of type characters, said hammer head consisting of non-magnetic material;
an elastic member connected to said hammer head at one end and to a base plate at the other end, said elastic member biasing said hammer head toward a printing position;
magnetic field producing means comprising a permanent magnet mounted in said printing hammer head to hold said hammer head at a non-printing position in such a way that the permanent magnet contacts with a magnetic material disposed at the non-printing position whereby mechanical energy is stored in said elastic member; and
an electromagnetic assembly disposed at the non-printing position for producing a magnetic field opposed to the magnetic flux of said permanent magnet when selectively actuated so that the mechanical energy stored in said elastic member is released to move said hammer head in the direction towards its printing position.

4,189,998

PRINT HAMMER AND INTERPOSER CAPTIVATING LINKAGE

Donald R. Morreall, New Hartford, N.Y., and Ronald F. Deuel, Shrewsbury, Pa., assignors to Mohawk Data Sciences Corp., Parsippany, N.J.

Division of Ser. No. 724,427, Sep. 17, 1976, Pat. No. 4,106,406. This application Mar. 9, 1978, Ser. No. 884,865
Int. Cl.[2] B41J *9/36*
U.S. Cl. 101—93.31 **4 Claims**



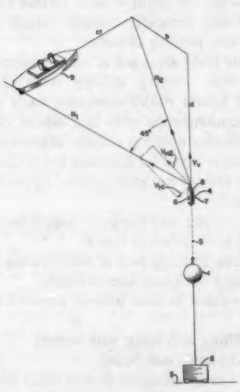
1. In an impact printer having a printer frame to which is mounted carrier means for periodically presenting a plurality of type die to a print line adjacent a document on which a printing operation is to be performed, and a print impacting mechanism, including at least one print hammer arranged to impact the document with selected ones of the type die at the print line, a source of mechanical energy including an impeller having at least one impeller tooth rotating in synchronism with the periodic presentation of the type die by the carrier means, an interposer having a mass smaller than the mass of the hammer and associated with the hammer and arranged for selective movement by a control element from a normal position into the path of motion of the impeller tooth such that the impeller tooth engages the interposer driving it and the associated print hammer from a rest position toward the print line to impact the document with a selected type die, said impeller tooth and hammer having the same plane of motion; said print impacting mechanism being characterized by the print hammer having a pair of spaced apart and generally parallel surfaces defined by a base end, a hammer head end and by a front and a back edge, the hammer head end having a hammer face toward the front edge and an interposer striking face toward the back edge, first and second spaced apart portions projecting from the back edge near the hammer head and base ends, respectively, with the base end being secured to the printer frame to allow pivotal motion of the hammer; by said interposer having a length **1** and a generally rectangular cross-section of dimensions x and y, where x is greater than y, and which is arranged to have its surface defined by the x dimension engaged by said impeller tooth; by said interposer being mechanically coupled to said print hammer in a linkage which allows motion of the interposer into and out of the path of said impeller tooth and captivates the smaller mass interposer to travel with the larger mass hammer after engagement of the interposer by the impeller tooth; by said interposer being flexible in the plane of motion of said hammer and impeller tooth and flexing in such plane when engaged by the impeller tooth such that a relatively smooth accelerating force is imparted to the print hammer and such that the removal of the interposer from the path of the impeller tooth and return to the normal position after such engagement is enhanced by such flexing and by the captivation linkage to the print hammer; said linkage being characterized by an aperture through said second portion in a direction generally parallel to said surfaces and large enough to allow insertion of the interposer with its x dimension parallel to said surfaces and to also allow rotation thereof until its y dimension is parallel to said surfaces and further characterized by a T-shaped opening through the first portion in a direction generally parallel to said surfaces and both legs of the T having a width slightly larger than y with the cross leg of the T having a length slightly larger than x so that the interposer may be inserted through both the aperture and the opening with its x dimension parallel to said surfaces and then rotated until it fits entirely within the cross leg of the T-shaped opening with its y dimension parallel to said surface.

4,189,999

VECTOR ACOUSTIC MINE MECHANISM

Lloyd D. Anderson, Takoma Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1956, Ser. No. 569,662
Int. Cl.[2] F42B *22/04*
U.S. Cl. 102—18 R **5 Claims**



1. A submarine mine actuating system responsive to the acoustic pressure signature of a target vessel moving through the water in the vicinity of the system comprising; an array of hydrophones including a first velocity hydrophone having a

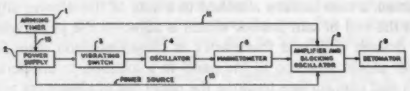
cosine response pattern and generating an electric signal in response to received underwater acoustic signals originating from said target vessel, and a second velocity hydrophone having a response pattern similar to that of said first hydrophone and disposed in orthogonal relation therewith whereby the axes of maximum sensitivity of said hydrophones are mutually perpendicular so that the signals produced by said hydrophones undergo a phase reversal as the target vessel crosses an axis of maximum sensitivity of one of said hydrophones; a pair of transformers each having a primary coil coupled to the output of a respective one of said hydrophones to receive an output signal therefrom, a ring demodulator circuit having a first and a second pair of input terminals each connected across the respective secondaries of said transformers, a center-tap at each secondary winding of said transformers for providing an output signal from said demodulator circuit correlative to the phase relationship of the signals applied across the input terminals of said circuit to thereby indicate a phase reversal of the received acoustic signal as the target vessel cross the axis of one of said hydrophones of said array.

4,190,000

MINE PROXIMITY FUSE

John M. Shaull, Bethesda, Md.; Godfrey R. Gauld, Seattle, Wash., and Lawson E. Richtmyer, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1962, Ser. No. 232,924
Int. Cl.[2] F42B *23/00*
U.S. Cl. 102—19.2 **4 Claims**



1. A proximity fuze for a stationary mine comprising:
(a) a power supply;
(b) a vibration sensitive switch having a stationary contact and a vibratory contact, one of said contacts being connected to said power supply;
(c) an LC ringing circuit connected to the other of said contacts, said vibration sensitive switch intermittently conducting current from said power supply to said LC ringing circuit when activated by vibrations in the region of said mine thereby setting up a series of exponentially decaying sinusoidal oscillations in said LC ringing circuit;
(d) magnetometer connected to said LC ringing circuit and excited by the sinusoidal oscillations produced thereby; and
(e) amplitude discriminating circuit means connected to said magnetometer for producing a firing pulse when the output of said magnetometer exceeds a predetermined value.

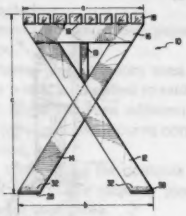
4,190,001

SPORT BENCH

Gregory Cecala, 86 Clapboard Ridge Rd., Greenwich, Conn. 06830

Filed Jun. 12, 1978, Ser. No. 914,946
Int. Cl.[2] A47B *13/00*
U.S. Cl. 108—161 **6 Claims**

1. A bench member to provide rest during strenuous or demanding athletic activity, said bench comprising:
(a) first and second pairs of leg members for supporting opposed ends of said bench member,
(1) each of said pairs of legs having centrally joined areas to form X-shaped end support legs,
(2) each of said pairs of legs having load bearing cross lapped areas with said legs interfitting at said central areas to form said X-shaped end support legs,
(b) top crossbar members secured to the tops of respective X-shaped end support legs,
(1) each pair of X-shaped leg members being end lapped at the top of said legs with one of said top crossbar members,
(c) and a seat member comprising individually spaced narrow but relatively thick members spanning and secured to said top crossbar members,



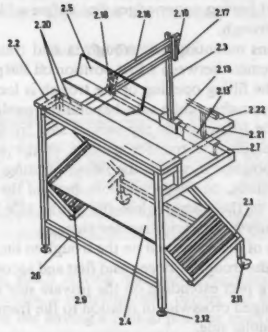
(1) each pair of X-shaped leg members being spread apart at the bottom of the leg members a distance greater than the width of the seat member to provide increased stability,
(d) said bench having a height from the bottom of said X-shaped end support legs to the top of said seat member of about twenty-four inches thereby requiring substantially less effort and knee flexure in transferring a user's weight to or from said bench member.

4,190,002

WORKPLACE EQUIPMENT

Peter Redemann, Berlin, Fed. Rep. of Germany, assignor to Schering, A.G., Berlin and Bergkamen, Fed. Rep. of Germany Division of Ser. No. 667,117, Mar. 15, 1976. This application

Apr. 7, 1978, Ser. No. 894,446
Int. Cl.[2] A47B *37/00*
U.S. Cl. 108—50 **2 Claims**



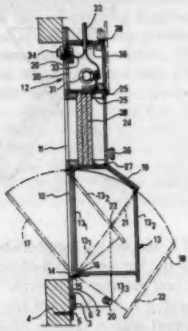
1. A worktable for belt conveyors (2) comprising two end sections (2.1), in the lower zone of which there are provided mounting rungs (2.9) for a vertically adjustable footrest (2.4) and which are connected by tubes (2.6) the top part of the table containing a step comprising a tabletop (2.2) with stop blocks (1.7) attached to the underside, said blocks holding said tabletop between tubes (2.20) extending between said end sections, a free space being provided beside said tabletop (2.2), for receiving a conveying means; said free space being bounded by a rearward longitudinal tube (2.7) connected between said end sections and wherein a second tabletop (2.22) is removably positioned in said free space supported on structure attached to said rearward tube (2.7).

4,190,003

COUNTER WINDOW FOR USE IN PARTICULAR IN CHEMIST'S SHOPS

Claude Bourlier, Saint Maurice, France, assignor to Societe Hygiaphone V.B., Fontenay sous Bois, France

Filed Aug. 18, 1978, Ser. No. 934,864
Claims priority, application France, Oct. 7, 1977, 77 30272
Int. Cl.[2] E05G 7/00
U.S. Cl. 109—19 8 Claims



1. A protected counter window comprising

a frame for being secured over an opening through a partition wall which separates a private side from a public side,

said frame having a frame plane part on the public side and having a transfer passage through the frame forming a private side opening on the private side of the frame and a public side opening which is located in the frame plane part and has a selected contour in the frame plane part,

a trough including a plane public side trough wall part which has a contour that fits said contour of the public side opening and a private side trough wall part,

said public side trough wall part and said private side trough wall part having upper edges that define a filling opening for the trough,

guide means mounting said trough in said transfer passage for movement between a first position on the public side in which the filling opening of the trough is located at least partially, on the public side, beyond the public side opening of the frame, while the private side trough wall part totally blocks the transfer passage of the frame, and a second position in which the filling opening is located at least partially, on the private side, beyond the private side opening of the frame, while the public side trough wall part totally blocks said transfer passage,

stop means of the frame and on the trough to limit the movement of the trough between said first and second positions,

a protective part extending on the private side of the frame and arranged crosswise in relation to the frame plane part on the public side,

said protective part including at least an upper part having a surface at least equal in size to the filling opening of the trough,

said trough being mounted by said guide means for movement to a third position intermediate said first and second position and whereat the plane public side trough wall part is located substantially in the plane of the public side opening of the frame plane part, while the upper part of the protective part totally blocks the filling opening of the trough, and

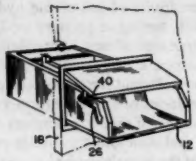
releasable locking means on the frame and on the trough to immobilize the trough in said third position so that the trough, in this third position, is totally inaccessible from either the private side or the public side.

4,190,004

TRANSACTION DRAWER

Daniel E. Richardson, St. Louis County, Mo., assignor to Shure Manufacturing Corporation, St. Louis, Mo.

Filed Sep. 22, 1978, Ser. No. 944,754
Int. Cl.[2] E05G 7/00
U.S. Cl. 109—19 5 Claims



1. A transaction drawer assembly for use in carrying out transactions through the wall of a building comprising a drawer framework, means for mounting said framework to an opening in the wall, a runway projecting into said building as part of the frame work to support a drawer for movement along the runway, rotatable means on the drawer to cooperate with said runway to facilitate movement of said drawer through the opening in the wall to, in part, project outside said wall, a panel at the end of the framework which is mounted to the opening in the wall, which panel is hinged to the framework at its top so that it closes the opening in the wall and is parallel to the wall and contiguous thereto when in closed position, a cam surface attached to a side of the drawer adjacent the end of said drawer which is adjacent the panel when the drawer is in said framework in closed position, cam follower means attached to the panel in a location to cooperate with said cam surface to move the panel out of alignment with the wall when the drawer is moved through said opening so that it projects through the wall.

4,190,005

PROCESS FOR PULVERIZING COAL USING COMBINATION GAS IN FLUID ENERGY PULVERIZERS

Donald H. Cookson, Pittsburgh, and Clifford W. McCoy, Oakdale, both of Pa., assignors to COMCO - Dravo Corporation and Electric Fuels Corporation, both of Pittsburgh, Pa.

Filed Dec. 15, 1978, Ser. No. 969,695
Int. Cl.[2] F23B 7/00
U.S. Cl. 110—347 5 Claims

1. In a process for pulverizing coal to form a coal-oil mixture and combusting said mixture to produce heat, wherein coal and a carrier gas stream, said carrier gas stream being at an elevated temperature and under superatmospheric pressure, are charged to a fluid energy pulverizer, with pulverized coal therefrom mixed with oil to form the coal-oil mixture, and hot combustion gases are produced by the combusting of the mixture, the improvement wherein:

said hot combustion gases are directed to a heat exchange unit;

a portion of said hot combustion gases are separated from the remainder thereof prior to reaching the heat exchange unit;

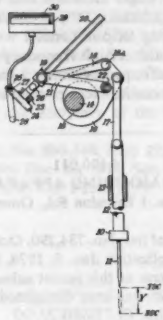
said portion of hot combustion gases is cooled, compressed and redirected to said heat exchange unit for heat exchange with said remainder of the hot combustion gases; and

said resulting heated, compressed portion of combustion gases is charged to the fluid energy pulverizer as said carrier gas for pulverizing of further coal.

4,190,006
TUFTING MACHINES

Leslie Mellor, Blackburn, England, assignor to Edgar Pickering (Blackburn) Limited, Lancashire, England

Filed Jul. 5, 1978, Ser. No. 922,100
Claims priority, application United Kingdom, Aug. 5, 1977, 33009/77
Int. Cl.² D05C 15/00
U.S. Cl. 112—79 R 2 Claims

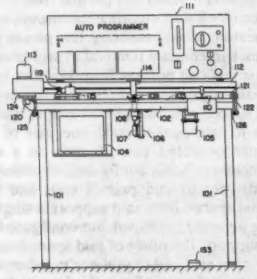


1. A tufting machine comprising a vertically reciprocable needle bar, push rods for imparting movement to the needle bar, a main shaft disposed parallel to the needle bar, and a linkage between the main shaft and each push rod, comprising a screw, an eccentric on the main shaft, a main link embracing the eccentric, another link connecting the main link to the push rod, a control link pivoted at one end to the main link and at the other end to a nut on the screw, a control yoke, of the same length as the control link, which is pivoted at one end to the nut coaxially with the control link and at the other end on a fixed pivot, the pivotal axes of the ends of the control link and the control yoke remote from the nut being coincident in the bottom dead centre position of the needle bar, and adjusting means accessible from the exterior of the machine for rotating all the screws to adjust the positions of the nuts thereon.

4,190,007
PROGRAMMING APPARATUS OF AUTOMATIC SEWING MACHINES

Koya Kimura, Numazu; Shinji Machi, Mishima, and Takao Manabe, Shizuoka, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,022
Claims priority, application Japan, Jun. 14, 1977, 52-70070
Int. Cl.² D05B 21/00
U.S. Cl. 112—121.12 13 Claims



1. In a programming apparatus for an automatic sewing machine comprising:

a programmer table for mounting a sheet member provided with marks and positions corresponding to stitch positions along a sewing pattern curve,

a moveable member having a connecting member for removably mounting a stylus which is to be positioned at said marks of said sheet member onto the table,

a drive means including pulse motors for moving for said movable member on said table in the X and Y directions of rectangular coordinates,

first control means including:

pulse generating means for generating pulses supplied to said pulse motors,

memory medium including a memory area for storing a number of pulses which are applied to said pulse motors for moving said stylus between adjacent ones of said mark along said sewings pattern curve corresponding to at least one address, and

a ROM writer for transferring the contents of said memory medium to a nonvolatile memory means,

the improvement which comprises,

second control means including:

means for reading out the content for said memory medium or said nonvolatile memory means for producing an instruction pulse train to relatively move said movable member, and

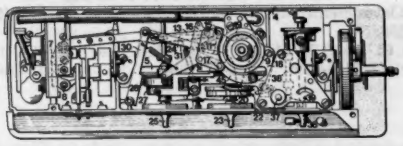
circuit means for supplying said instruction pulse train to said pulse motors, thus moving said movable member in accordance with the content stored in said memory means or in said nonvolatile memory means, and

means for forming a pattern contour corresponding to the content of said memory medium or nonvolatile memory means on a not yet worked cloth clamping plate mounted on said movable member by said connecting member during the operation of said second control means.

4,190,008
ZIGZAG STITCH SEWING MACHINE

Olindo Baruffa, Thonex, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Dec. 18, 1978, Ser. No. 970,158
Claims priority, application Switzerland, Dec. 22, 1977, 15855/77
Int. Cl.² D05B 3/00
U.S. Cl. 112—158 B 4 Claims



1. A zig-zag stitch sewing machine comprising a laterally displaceable needle, a reciprocatable carrier bar for said needle, said carrier bar having a central position and two terminal decentered positions, pivotable cradle means for said reciprocatable carrier bar, a connecting rod having first and second ends pivotally connected, at said first end, to said cradle means, a pivotable slider contactable with said second end of said rod, lever means for displacing said second end of said rod along said slider, a pivot axis for said slider, said pivot axis being displaceable, pivotable lever means carrying said pivot axis for said slider such that said pivot axis has a free end, said slider carrying feeler means, cam means contactable with said feeler means, a cam shaft for said cam means, drive means for said cam shaft, selector means for selecting a desired cam from said cam means and means for displacing said pivotal axis of said slider while said free end of said pivot axis is immobilized in a terminal angular position whereby displacement of said second end of said connecting rod along said slider causes the needle

carrying bar to be displaced between said two terminal decentered positions.

4,190,009

LINKING MACHINES

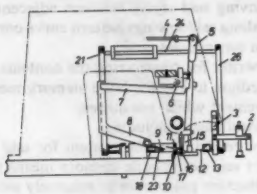
Denis Matthews, Sutton in Ashfield, England, assignor to Mathbirk Limited, Sutton in Ashfield, England

Filed Jun. 8, 1978, Ser. No. 914,233

Claims priority, application United Kingdom, Jun. 15, 1977, 24963/77

Int. Cl.[2] D05B *1/00, 97/00*

U.S. Cl. 112—262.1 **6 Claims**



1. A linking machine having a plurality of radially extending points for impalement of two or more pieces of fabric to be joined together by a seam and a pair of reciprocal imperforate hooked needles, each needle being adapted to form a simple single thread chain stitch, wherein one needle is disposed on and operates from one side of fabrics impaled on the points and the other needle is disposed on and operates from the other side of the impaled fabrics, separate thread providing means for each needle, each said thread providing means being disposed on the side of the impaled fabrics opposite to the side on which its associated needle is disposed, said needles being operable to join the fabrics by a balanced seam which includes two separate single thread chain stitches.

4,190,010

WATERPROOF INWARDLY FACING GARMENT SEAMS PRODUCED BY HIGH FREQUENCY WELDING

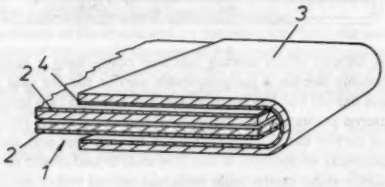
Noel Bibby, East Bridgford, England, assignor to Noel Bibby Limited, Nottingham, England

Filed Mar. 10, 1978, Ser. No. 885,232

Claims priority, application United Kingdom, Mar. 18, 1977, 11506/77

Int. Cl.[2] A41D *27/24;* B29C *27/04;* B32B *3/06, 7/08;* C09J *5/10*

U.S. Cl. 112—419 **18 Claims**



1. A garment comprising a seam joining together two edges of a fabric, in which each edge has a face coated with a high frequency activated material and a binding strip has one face coated with a high frequency activated material, the seam being formed by said two edges of fabric being located with the said coated faces in contact with the coated face of the binding strip, and in which the adjacent coated faces are welded together by the application of a radiofrequency field, said seam facing inwardly of said garment.

2. A garment according to claim **1**, in which the said two edges are sewn together, the sewing being covered by the binding strip.

3. A garment according to claim **1**, in which the binding strip is sewn on to the said two edges before welding of the said coated faces.

10. A method of forming a seam on the inside of a garment which seam joins together two edges of a fabric of said garment, each edge of said fabric having a face coated with a high frequency activated material, which comprises locating together the said two edges with the said coated faces facing outwardly, locating a binding strip over the said coated faces, the face of the binding strip in contact with the coated faces itself being coated with a high frequency activated material, and applying a radiofrequency field to the seam to weld together adjacent said coated faces of the binding strip and fabric.

4,190,011

BOAT MOORING APPARATUS

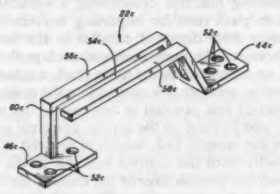
Stephen F. Guthmann, 1 Brandon Rd., Onondaga County, N.Y. 13214

Continuation-in-part of Ser. No. 734,290, Oct. 20, 1976, Pat. No. 4,109,603. This application Jun. 5, 1978, Ser. No. 912,725

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—230 **30 Claims**



15. A boat mooring cleat apparatus for enabling quick releasable mooring of a boat to a mooring post means by a mooring line means having an associated diameter and a plurality of longitudinally spaced apart bulges therealong, said bulges having transverse dimensions greater than said mooring line means diameter, said cleat apparatus comprising a pair of substantially parallel spaced apart members comprising a convex and a concave side defining a slot for insertably receiving a portion of the proximal end of said mooring line means, said slot being narrower in width than the transverse dimensions of any one of said bulges, said spaced apart members defining a stop member on the concave sides of said members for an adjacent one of said bulges of said inserted mooring line means proximal end portion for preventing removal of said inserted mooring line means proximal end portion from said cleat apparatus by a force along said mooring line means while enabling both quick insertion of said mooring line means proximal end portion and quick intentional removal of said inserted mooring line means proximal end portion from said slot by a sufficient force substantially normal to said mooring line means, one pair of ends of said spaced apart members being in transverse registration, means to interconnect said one pair of ends and to mount said interconnected pair of ends on a support, said spaced apart members being configured to extend away from the support adjacent to said pair of ends and thereafter to extend along and spaced from said support, a single one of said members being inverted U-shaped and configured to extend to an end at the support, the other of said spaced apart members terminating short of said end of said one member to provide an access opening spaced away from the longitudinal center of said inverted U-shaped member for insertion of a bulge along said mooring line means, mounting means adjacent to said end of said one member closest to said access opening adapted to be fastened to said support such that said access opening is posi-

tioned further away from said mooring post means than said transversely registered ends, so that a tensile force acting on the mooring line means from the mooring post means draws the inserted bulge away from the access opening, said slot enabling a predetermined slippage of said inserted mooring line means within said slot dependent upon the longitudinal extent between the transversely registered ends and said access opening.

4,190,012

FAIRED TOW CABLE WITH STUBS FOR STRUM REDUCTION

Peter P. Rispin, Washington, D.C.; Bruce L. Webster, Sterling, Va.; John Stasiewicz, Gaithersburg, and Jesse S. Diggs, Rockville, both of, Md. assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 690,348, May 27, 1976, abandoned. This application Dec. 28, 1978, Ser. No. 973,988

Int. Cl.[2] F15D *1/10*

U.S. Cl. 114—243 **1 Claim**

1. Fairing means on the periphery of a towing cable for reducing strumming vibrations induced in the cable as it is towed generally longitudinally of its length through water comprising:

a plurality of discontinuous elongate stubs longitudinally spaced apart from one another along respective coextensive right hand and left hand helical paths which crisscross one another about the periphery of the cable.

4,190,013

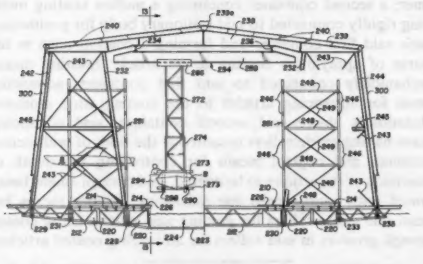
FLOATING DRY STORAGE FACILITY FOR SMALL BOATS

Roger W. Otis, and Stephen H. Otis, both of P.O. Box 518, McAlester, Okla. 74501

Continuation-in-part of Ser. No. 780,236, Mar. 22, 1977, Pat. No. 4,070,979. This application Jan. 30, 1978, Ser. No. 873,313

Int. Cl.[2] B63B *35/44*

U.S. Cl. 114—263 **15 Claims**



9. A floating dry storage facility for removing and storing boats of a maximum predetermined length comprising: a platform having a plurality of spaced horizontal members positioned through the length of the facility and spanning across the facility means connecting said horizontal members; flotation means secured under said platform between the spaced horizontal members to float the platform on the surface of a body of water; a housing secured on said platform; boat storage means secured in said housing for dry storage of the boats on a plurality of levels above the platform; and lift means adapted to move the boats from the body of water to said boat storage means and back again.

4,190,014

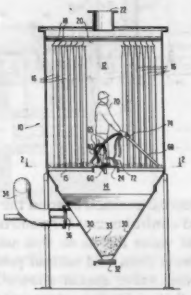
INDUSTRIAL DUST COLLECTOR CLEANING SYSTEM AND METHOD

Hugh N. Jenkins, 3555 Duberry Ct., N.E., Atlanta, Ga. 30319, and Robert P. Black, 4151 Echo Woods Dr., Clarkston, Ga. 30021

Filed Jun. 19, 1978, Ser. No. 916,470

Int. Cl.[2] B01D *46/02*

U.S. Cl. 116—266 **10 Claims**



1. A system for cleaning the filtration chamber of an industrial dust collector of the type having a gas intake chamber including a gas inlet, a filtration chamber having a clean gas outlet, the filtration chamber being in communication with the gas intake chamber and a plurality of fabric filter bags having filtering surfaces disposed within the filtration chamber wherein the bag filtering surfaces are in fluid communication with the gas intake chamber, said cleaning system including means for collecting dust in said filtration chamber, and means for directing collected dust from said filtration chamber and into said gas intake chamber, and said dust directing means comprising a venturi having a first inlet in fluid communication with said filtration chamber, a source of compressed air, a second inlet in fluid communication with the source of compressed air, and an outlet in fluid communication with said gas intake chamber.

9. A method of locating ruptures in the filtering surfaces of fabric filter bags mounted in the filtration chamber of an industrial dust collector with the filter bags filtering surfaces in fluid communication with a gas intake chamber and with said method comprising the steps of forcing gases from the gas intake chamber into the filtration chamber through the fabric filter bags while simultaneously evacuating dust from the filtration chamber exteriorily of the filter bags and directing the evacuated dust from the filtration chamber into the gas intake chamber, whereby evacuated dust may be forced back into the filtration chamber within the filter bags and through any bag ruptures thereby rendering such ruptures visible to an observer stationed within the filtration chamber.

4,190,015

APPARATUS FOR DISPENSING LIQUID TO SPINNING WORKPIECES

Gary Hillman, Livingston, N.J., assignor to Machine Technology, Inc., Whippany, N.J.

Filed Dec. 8, 1977, Ser. No. 858,516

Int. Cl.[2] B05B *13/04*; B05C *5/00*

U.S. Cl. 118—696 **5 Claims**

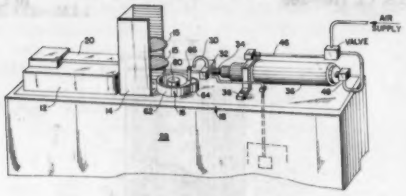
1. In a machine for dispensing liquid to workpieces which are to be coated by spinning said workpieces to disperse said liquid, liquid dispensing apparatus, comprising:

a dispensing nozzle for dispensing said liquid over a central

area of a workpiece which is spun to disperse said liquid outwardly from said central area over the surface of said workpiece;

liquid supply means connected to said nozzle for supplying liquid thereto, said liquid supply means including valve means for selectively controlling the flow of liquid to said nozzle; and

means for preventing the undesired dispensing of liquid onto said workpiece including moving means for moving said nozzle between a first position situated above said central area of said workpiece to which said liquid is to be dispensed and a second position beyond the periphery of said workpiece, and control means for controlling said moving means and said valve means so that said moving means moves said nozzle from said second position to said first position and said valve means allows liquid to be dispensed, and so that said valve means interrupts the flow of liquid and said moving means moves said nozzle from said first position to said second position substantially simultaneously so that while said nozzle is being moved from above the central area of said workpiece to beyond the periphery of said workpiece, undesired dispensing of liquid on said workpiece is prevented.

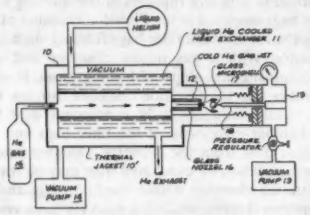


4,190,016

CRYOGENIC TARGET FORMATION USING COLD GAS JETS

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 13, 1979, Ser. No. 20,121
Int. Cl.² G21B *1/00*
U.S. Cl. 118—724 **11 Claims**



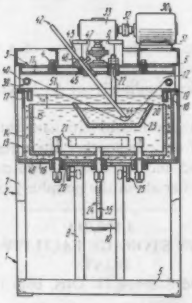
1. An apparatus for forming a substantially uniform layer of cryogenic material on an inner surface of a spherical member comprising: means for supporting a spherical member containing cryogenic material within means defining a chamber, jet nozzle means adapted to be positioned about a spherical member mounted within said chamber, means for directing gas through said jet nozzle means onto the spherical member to freeze said cryogenic material, and means for controlling the temperature of the gas flowing through said jet nozzle means, which includes means for raising the temperature of said gas to a point above the solidification temperature of the cryogenic material thereby allowing the cryogenic material to vaporize, and includes means for lowering the temperature of said gas to a point below the solidification temperature of the cryogenic material causes same to form into a substantially uniform layer within the spherical member.

4,190,017

TANK FURNACE FOR HOT-DIP METAL COATING

Nikolai K. Bizik, ulitsa Geroev Sevastopolya, 23, kv. 6; Isidor I. Frumin, ulitsa Bolshaya Zhitomirskaya, 17, kv.6; Vladimir P. Sotchenko, ulitsa P. Tychiny, 13, kv. 210; Valery F. Barabash, ulitsa Sholom-Aleikhema, 15/2, kv. 34; Petr F. Chernyak, Brest-Litovsky prospekt, 47a, kv. 23; Evgeny I. Frumin, ulitsa Shumskogo, 8, kv. 306; Grigory B. Asoiants, bulvar Lesi Ukrainki, 2, kv. 16, all of Kiev; Vadim A. Kulesha, ulitsa Pushkinskaya, 51a, kv. 25, Beloretsk Bashkirskoi ASSR; Viktor A. Golomazov, ulitsa Lenina, 64, kv. 8, Beloretsk Bashkirskoi ASSR; Dias A. Ibragimov, ulitsa, Fedora Alexeeva, 37, kv. 36, Beloretsk Bashkirskoi ASSR; Nikolai I. Kozhevnikov, ulitsa Khudai Berdina,20o, Beloretsk Bashkirskoi ASSR; Nikolai P. Chernenko, ulitsa Poschinskaya, 13, kv. 31, Orel; Vitaly S. Starchenko, Moskovskoe Shosse, 157, kv. 12, Orel, and Alexei S. Kalosha, ulitsa Komsomolskaya, 77, kv. 29, Orel, all, U.S.S.R.

Filed Jan. 10, 1978, Ser. No. 868,463
Claims priority, application U.S.S.R., Jan. 21, 1977, 2437802
Int. Cl.² B05C *3/15*
U.S. Cl. 118—74 **5 Claims**



1. A tank furnance for hot metal coating, comprising: a stationary body; a first container mounted inside said body containing a molten flux; electrodes mounted in said first container; a second container containing a molten coating metal being rigidly connected to said stationary body for positioning inside said first container and forming a coating zone in the course of applying a coating to an article; hoisting means mechanically connected to said first container; advancing means for advancing articles to the coating zone mounted substantially above said second container, said advancing means having guide rollers mounted at the sides of said second container, and control means for controlling the depth of immersion of the articles to be coated, said control means being formed with cantilevered bar means and header means between said guide rollers for guiding said articles being coated through grooves in said rollers for advancing coated articles.

4,190,018

POWDER DENSITY CONTROL CIRCUIT FOR A PHOTOCOPIER

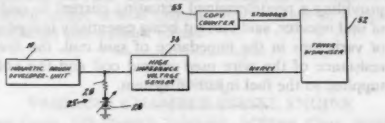
Robert C. Ariotti, Stamford; Harold M. Stahl, Ridgefield, and Lawrence E. Clifford, Danbury, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 2, 1979, Ser. No. 8,728
Int. Cl.² G03G *15/09*
U.S. Cl. 118—690 **6 Claims**

1. A powder density control circuit for use in a photocopier

machine of the type in which a photoconductor is charged in accordance with an image to be recorded thereon and is developed by contact with a toner powder attracted thereto from a mixture of carrier particles and toner powder carried by a magnetic brush of a developer assembly including a replenishment means for periodically adding toner powder to said machine comprising:

(a) a resistor stabilized bias power supply coupled to the magnetic brush of the developer assembly,



(b) means for sensing the change in voltage of the resistor stabilized bias power supply during toning of an image on a photoconductor, and

(c) means for controlling the replenishment means in response to a predetermined change in voltage during toning thereby controlling the amount of toner powder which is replenished to the mixture in the developer assembly.

4,190,019

VACUUM METALLIZING INTERIOR OF HOLLOW ARTICLE WITH MASKING SHIELD

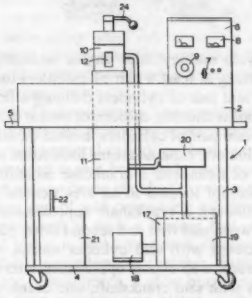
Claude J. L. Hunt, Hinton Hall, Peterchurch, Herefordshire, England

Filed Sep. 14, 1977, Ser. No. 833,340

Claims priority, application United Kingdom, Sep. 18, 1976, 38768/76; Mar. 25, 1977, 12554/77

Int. Cl.[2] B44D *1/34*; C23F *1/34*

U.S. Cl. 118—720 **9 Claims**



1. Apparatus for vacuum metallising the interior surface of hollow articles made of plastic material, the apparatus comprising a hollow body connected to a high vacuum source, a seating on said hollow body for engagement by a hollow plastic article so that the interior of said article and said hollow body are in communication, a heating assembly having a filament for vaporising coating metal mounted within said hollow body and a shield enclosing said heating assembly, said shield having an aperture aligned with said seating whereby vaporised coating metal is directed towards the interior of said plastic article.

4,190,020

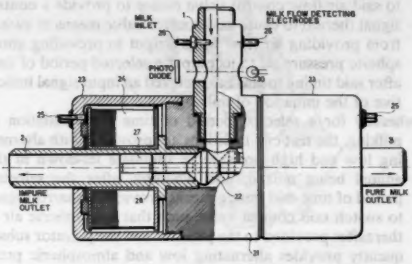
PROCESS AND EQUIPMENT FOR MACHINE MILKING TO PROVIDE STERILE MILK FREE FROM BLOOD AND PUS

Károly Tamás, Kalocsa; Ferenc Vörös, Kaposvár, and Ilona Bedö, Budapest, all of Hungary, assignors to Mezogazdasagi Foiskola, Kaposvar, Denesmajor, Hungary

Filed Jan. 3, 1978, Ser. No. 866,783

Int. Cl.[2] A01J *7/00*

U.S. Cl. 119—14.08 **6 Claims**



1. A process for milking a cow, comprising attaching milking apparatus to the cow and operating said apparatus to withdraw milk from the cow, diverting to a bypass tank for a predetermined time that portion of the milk which first flows from the cow, thereafter diverting the flow of milk from the cow to a main vessel, continuously colorimetrically monitoring the milk during its flow to said main vessel, and rediverting the milk from said main vessel to said bypass tank whenever the color of the milk changes from a predetermined color characteristic of healthy milk.

4,190,021

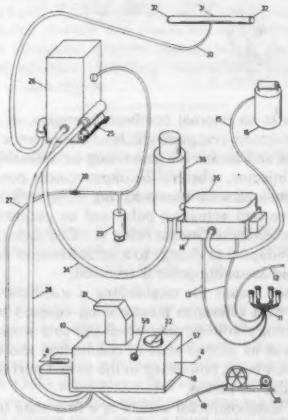
AUTOMATIC STIMULATION APPARATUS FOR MILKING MACHINES

Rolf W. Reisgies, 2101 Norco Dr., Norco, Calif. 91760

Filed May 22, 1978, Ser. No. 908,078

Int. Cl.[2] A01J *5/04*

U.S. Cl. 119—14.44 **8 Claims**



1. Apparatus for providing selected automatic stimulation pressures to the teat cups of a milking machine through the atmospheric air input port of the vacuum line pulsator, comprising:

(a) an air flow supply restrictor adapted to be connected to a source of air under pressure;

(b) an air flow control valve connected to receive air flow from said restrictor and also adapted to receive atmospheric air and being switchable in response to a control signal to switch from providing air flow to its output to providing atmospheric pressure air to its output, the output of said air flow control valve being adapted to be connected to the atmospheric air input port of a vacuum line pulsator;

(c) timing means responsive to an input signal and connected to said air flow control valve means to provide a control signal thereto to cause said control valve means to switch from providing air flow to its output to providing atmospheric pressure air to its output a selected period of time after said timing means has received an input signal indicative of the initiation of milking;

whereby for a selected period of time after initiation of milking, the teat cup inflations are provided with alternating low and high pressure to stimulate let-down in the animal being milked, and whereby, after the selected period of time said timing means provides a control signal to switch said control valve such that atmospheric air is thereafter provided to the pulsator and the pulsator subsequently provides alternating low and atmospheric pressure to the teat cups as in normal milking.

4,190,022

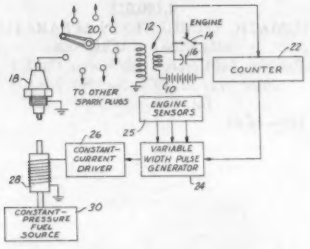
FUEL INJECTION SYSTEM WITH CORRECTION FOR INCIDENTAL SYSTEM VARIABLES

E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 629,353, Nov. 6, 1975, abandoned. This application Jan. 26, 1978, Ser. No. 872,412

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EF **2 Claims**



1. For use in an internal combustion engine, an improved fuel injection system comprising at least one injector having an actuating coil and means for generating an actuating pulse to actuate said injector, wherein the improvement comprises:

(a) first semiconductor means having an input port adapted to receive said actuating pulse and an output port, said first semiconductor means being in a first state of conduction and adapted to change to a second state of conduction when said actuating pulse is received;

(b) reference means for establishing a stabilized reference voltage, said reference means being adapted to provide said reference voltage only when said first semiconductor means is in its second state of conduction and said reference means being connected to the output port of said first semiconductor means;

(c) second semiconductor means in a first state of conduction, said second semiconductor means having an input port connected to said reference means and an output port, and said second semiconductor means being responsive to said reference means such that said second semiconductor means changes to its second state of conduction when said reference means provides said reference voltage to the input port of said second semiconductor means;

(d) third semiconductor means in a first state of conduction, said third semiconductor means having an input port associated with the output port of said second semiconductor means and an output port associated with said coil of said injector, said third semiconductor means being responsive to said second semiconductor means such that when said second semiconductor means changes to its second state of conduction said third semiconductor means changes to its second state of conduction, thereby providing a predetermined actuating current to said coil of said injector, said current being essentially independent of variations in the impedance of said coil, the specific resistance of the wire used in said coil and the voltage supplied to the fuel injection system.

4,190,023

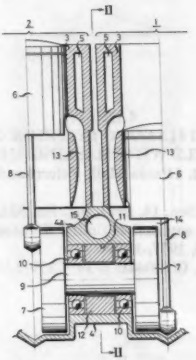
COOLING SYSTEM FOR LIQUID-COOLED TYPE OF TWO-CYCLE MULTICYLINDER ENGINE

Tetsuzo Fujikawa, and Michio Nishimura, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 688,027, May 19, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,075

Int. Cl.[2] F02F *1/14*

U.S. Cl. 123—41.72 **1 Claim**



1. In a two-cycle multicylinder engine including cylinder block means defining at least a pair of cylinders located adjacent each other, said pair of cylinders defining a first side and a second side opposite thereto, carburetor means including fuel intake means for said pair of cylinders located on said first side of said pair of cylinders, exhaust means located on said second side of said pair of cylinders, a crankcase including a thick-walled portion thereof located in an area generally between said adjacent cylinders, a crankshaft approximately equidistantly spaced between said first and second sides, piston means operatively associated with said cylinder means, connecting rod means and crank web means operatively interconnecting said piston means with said crankshaft, said crank web means including a pair of crank webs located on opposite ends of said crankshaft, crankshaft bearing means located between said crankshaft and said thick-walled portion of the crankcase, and liquid jackets located in said cylinder block means, the improvement comprising:

a cooling system for said engine consisting essentially of a cooling liquid passage formed to extend through said thick-walled portion of said crankcase in a generally straight configuration from said first side to said second side of said pair of cylinders at a location generally equivalently spaced from each of said adjacent cylinders;

said cooling liquid passage being located in an area generally above said crankshaft and being in the form of a through-

hole formed through said thick-walled portion of the crankcase and located in proximity to said crankshaft bearing means at a point approximately equidistantly spaced from said pair of crank webs;

a liquid pump having a delivery port connected in flow communication to one end of said coupling liquid passage at said first side of said pair of cylinders

said liquid pump being mounted beneath said carburetor means and attached to said crankcase at said first side of said pair of cylinders; and

means on said second side of said pair of cylinders flow-connecting the other end of said cooling liquid passage to said liquid jacket in said cylinder block means at a location adjacent said exhaust means.

4,190,024

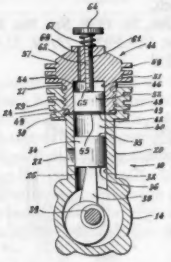
VARIABLE CHAMBER DIESEL ENGINE

Robert Davis, 125 Welch's Point Rd., Milford, Conn. 06460

Filed Jul. 21, 1977, Ser. No. 817,691

Int. Cl.[2] F02B *75/04*

U.S. Cl. 123—48 A **26 Claims**



1. A diesel engine comprising an engine cylinder having a cylindrical internal bore, said bore containing a movable, cylindrical piston having a top and a bottom, a combustion chamber being disposed inside said bore above said top of said piston, the rate of firing of said engine being inversely proportional to the size of said combustion chamber, and a flexible membrane being disposed in said bore and partially defining said combustion chamber so that the size of said combustion chamber is variable by selectively flexing said membrane, said membrane sublimating when safe operating temperatures are exceeded inside said combustion chamber thereby allowing any gas in said combustion chamber to escape from said combustion chamber.

19. A method for converting a two-cycle glow-plug engine to a diesel engine, said glow-plug engine comprising an engine cylinder having a central cylindrical bore, a cylindrical piston movably mounted in said bore, said piston having a top and a bottom, said bottom being attached to one end of a connecting rod, the other end of said connecting rod being attached to a rotatable crankshaft in such a manner that reciprocal movement of said piston in said bore causes rotational movement of said crankshaft, a combustion chamber disposed in said bore above said top of said piston, a glow plug head mounted in the end of said bore opposite said piston, said glow plug head sealing said combustion chamber and supporting a glow plug for ignition of fuel in said combustion chamber, wherein said method comprises:

A. removing said glow plug head and said glow plug;

B. inserting a flexible, heat-reflective membrane into said bore;

C. positioning said flexible membrane in said bore so that said membrane is disposed above said top of said piston so as to become the top of said combustion chamber;

D. securing said membrane in place forming a gas-tight seal with the remainder of said combustion chamber;

E. securing to said engine cylinder a diesel head having means for flexing said membrane whereby the decreasing and increasing of the size of said combustion chamber may be controlled.

4,190,025

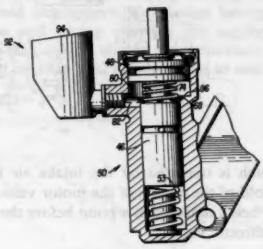
TIMING CHAIN TENSIONERS

Heinz Wahl, 2418 N. Utah St., Arlington, Va. 22207

Filed Jan. 25, 1978, Ser. No. 872,259

Int. Cl.[2] F01L *1/46*; F16H *7/12*

U.S. Cl. 123—90.31 **8 Claims**



1. In a chain tensioner for a timing chain of an internal combustion engine having a crankshaft, a chain tensioner wheel arranged on a pivotable support arm in meshing engagement with said timing chain, said chain tensioner and timing chain arranged in a timing chain housing of said engine, said chain tensioner comprising a chain tensioner housing, a hydraulic dashpot arranged in said chain tensioner housing, said hydraulic dashpot including a cylinder, a dashpot valve and a piston arranged in said cylinder, said piston having a plunger bearing against said support arm and pivoting said chain tensioner wheel into tensioning relationship with said timing chain, a resilient element in said cylinder for urging the plunger of said piston toward said support arm, the improvement comprising a fluid reservoir affixed to said chain tensioner housing in fluid communication with the cylinder, said fluid reservoir having an upwardly open end for exposing the fluid in said reservoir to the atmosphere in said timing chain housing and for collecting oil droplets entrained in said atmosphere, baffle means arranged adjacent the open end of the reservoir for limiting loss of oil from said reservoir caused by centrifugal forces acting on the oil in said reservoir, said baffle means comprising a pair of plates affixed to said reservoir adjacent the upper open end thereof, said plates having confronting edges defining an elongated aperture therebetween, the lengthwise axis of said aperture extending substantially parallel to the crankshaft of said engine.

4,190,026

AUTOMOBILE SPEED CONTROL METHOD AND SYSTEM

Naoji Sakakibara, Chiryu, Japan, assignor to Aisin Seiki Co., Ltd., Japan

Filed Sep. 27, 1977, Ser. No. 837,291

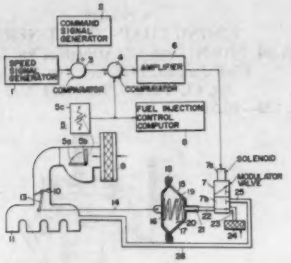
Claims priority, application Japan, Oct. 26, 1976, 51-129173

Int. Cl.[2] B60K *31/00*

U.S. Cl. 123—102 **5 Claims**

1. A speed control system for use with a motor vehicle having an engine coupled with an intake manifold housing a throttle valve, said speed control system being of the type including a tachometer which is operatively connected to said engine and which generates a first signal corresponding to the vehicle's speed; a second signal generator which generates a preselected driving speed signal; a third signal generator which generates a negative feedback signal; comparator means for receiving the first signal, the preselected driving speed signal and the negative feedback signal, comparing those three signals, and generating a throttle valve position control signal;

and means responsive to the throttle valve position control signal for moving the throttle valve, wherein the improvement comprises: the third signal generator is an intake air flow rate



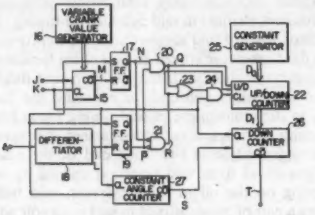
detector which is operated by the intake air flow into the intake manifold of the engine of the motor vehicle, the intake air flow rate being detected at a point before the incoming air reaches the throttle valve.

4,190,027

ELECTRONIC SPARK TIMING ADVANCING APPARATUS

Tomoji Inui; Yasunori Mori, both of Katsuta; Seiji Suda, and Toshio Furuhashi, both of Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 27, 1977, Ser. No. 836,956
Claims priority, application Japan, Sep. 29, 1976, 51/115798
Int. Cl.² F02P 5/04
U.S. Cl. 123—117 R **11 Claims**



1. An electronic spark timing advancing apparatus for an internal combustion engine including an ignition device, comprising:

first means for sensing the crank rotation angle of the engine;

second means for sensing the cylinder internal pressure of the engine;

third means for detecting the crank angle at which the internal pressure sensed by said second means reaches a peak value in accordance with the crank angle sensed by said first means and generating a crank angle signal representative thereof;

fourth means for generating a first command signal representative of a first crank angle at which the cylinder internal pressure is to assume a first peak value under a first set of given conditions including at least one of the conditions of rapid acceleration of the engine, warm-up of the engine and engine braking, and for generating a second command signal representative of a second crank angle at which the cylinder internal pressure is to assume a second peak value under a second set of given conditions comprising a steady state operation of the engine, and for supplying one of said first and second command signals to an output thereof depending upon the corresponding one of said first and second sets of given conditions under which the engine is operating;

fifth means for detecting a deviation between the crank angle signal provided by said third means and the one of said first and second command signals supplied at the output of said fourth means; and

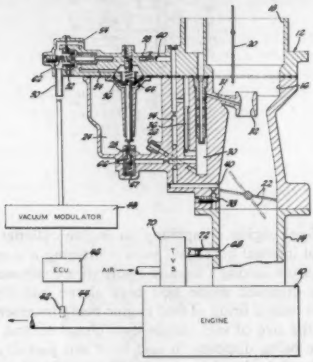
sixth means, responsive to the deviation detected by said fifth means, for controlling the spark timing of said ignition device to minimize and said deviation.

4,190,028

MIXTURE FORMING ASSEMBLY FOR CLOSED LOOP AIR-FUEL METERING SYSTEM

Clifford R. Carlson, Fenton, and Alan F. Chiesa, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1978, Ser. No. 927,504
Int. Cl.² F02M 23/04, 21/02
U.S. Cl. 123—119 EC **3 Claims**



1. In an engine having means for measuring the air-fuel ratio of the air-fuel mixture delivered to the engine, an air-fuel mixture forming assembly comprising an induction passage having an air inlet, a throttle disposed in said induction passage and movable between idle and part throttle positions for controlling flow therethrough, idle and main fuel passages opening to said induction passage for delivering fuel thereto when said throttle is in said idle and part throttle positions respectively to thereby form idle and part throttle air-fuel mixtures therein, and metering apparatus controlling fuel flow through said fuel passages and regulated between a lean mode causing restriction of fuel flow through said passages and a rich mode permitting increased fuel flow through said passages, said metering apparatus being regulated by said measuring means to maintain the idle and part throttle mixtures at a selected air-fuel ratio, wherein the part throttle mixture is leaner than the idle mixture in a particular regulated mode of said metering apparatus during certain engine operating conditions, and wherein said assembly further comprises means for leaning the idle mixture only during said certain engine operating conditions to thereby cause said measuring means to regulate said metering apparatus to said rich mode, whereby said metering apparatus is regulated to said rich mode as said throttle is moved from said idle position to said part throttle position and a lean part throttle mixture is avoided during said certain engine operating conditions.

4,190,029

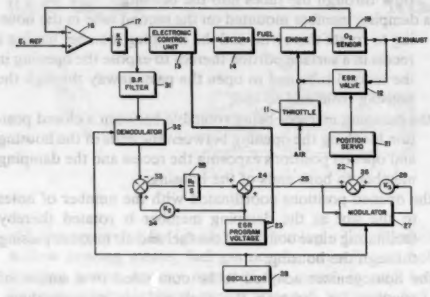
CONTROL OF EGR IN A CLOSED LOOP EFI ENGINE

Lael B. Taplin, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 826,002, Aug. 19, 1977. This application Oct. 30, 1978, Ser. No. 955,851

Int. Cl.[2] F02M *7/00*

U.S. Cl. 123—119 A **11 Claims**



1. In an internal combustion engine having sensor means exposed to exhaust gases from the engine providing a feedback signal, means for controlling the quantity of exhaust gas recirculated from the exhaust of the engine to form a part of the combustion charge therefore, said control means comprising,

an adjustable valve for metering exhaust gas from the exhaust of the engine to the combustion chamber thereof;

program voltage source means for generating a plurality of electrical signals each indicating the desired exhaust gas recirculation;

adjusting means for adjusting said valve in accordance with one of said signals for said program voltage source means;

means for imposing an oscillation upon the adjustment provided by said adjusting means, said oscillation having a predetermined frequency and an amplitude constituting a fixed percentage of said adjustment;

means for detecting oscillation in the output of the sensor means occurring at said predetermined frequency of oscillation imposed upon said adjustment, the level of the output of said detecting means being proportional to the amplitude of said predetermined frequency oscillation in the sensor output;

means for comparing the output level of said detecting means with said signals from said program voltage source means to determine the relationship of said output level with the amplitude of said oscillation imposed upon said adjustment; and

means responsive to said comparing means for modifying the adjustment of said adjusting means until the output of said detecting means bears a fixed relationship to the amplitude of said oscillation imposed upon said adjustment.

4,190,030

CARBURATION SYSTEM

Jerry D. Chester, Rte. #2, Sturgis, Mich. 49091

Filed Dec. 21, 1977, Ser. No. 863,054

Int. Cl.[2] F02B *31/00, 39/00, 13/03*

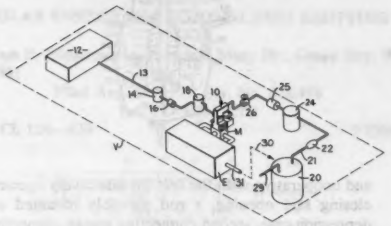
U.S. Cl. 123—119 R **16 Claims**

1. A carburation system for supplying a fuel air mixture to an internal combustion engine, comprising:

a hollow base securable to said engine for supplying said fuel air mixture thereto, and having a mixing chamber therein;

fuel-pressurized air premix means having a fuel passage connected to a fuel supply and a pressurized air passage connectible to pressurized air supply, a fuel throttling valve and a pressurized air throttling valve interposed in said fuel passage and pressurized air passage, respectively, for controlling flow therethrough, and premix nozzle means including fuel jet means at the outlet of said fuel passage and pressurized air jet means at the outlet of aid pressurized air passage and located near said fuel jet means for atomizing fuel therefrom and directing pressurized air carrying finely divided fuel particles into said mixing chamber through a premix opening in said hollow base, said fuel-pressurized air premix means being secured at said nozzle to said hollow base;

atmospheric air means having an atmospheric air passage and an atmospheric air throttling valve interposed in said atmospheric air passage for controlling flow therethrough, said atmospheric air passage having an outlet opening to said mixing chamber for supplying a final mixture of atmospheric air and the premixture of fuel and pressurized air from said nozzle means to said engine;



an operator controllable throttle member operatively connected to said fuel throttling valve, pressurized air throttling valve and atmospheric air throttling valve, said fuel throttling valve and pressurized air throttling valve having actuators extending movably from said premix means, said throttle member being a lever with means pivoting same with respect to said premix means, said throttle lever extending from said pivot means past said actuators for said fuel and pressurized air throttling valves to a remote portion, said atmospheric air throttling valve having an actuator actuable by said remote portion of said throttle lever, said atmospheric air and pressurized air and fuel throttling valves being reciprocating spring closed valves each having as its actuator a stem engaging said throttling lever through an axial adjustment means presettable for setting the closed position of the corresponding throttling valve at a desired position of said throttling lever.

4,190,031

DEVICES FOR RE-CYCLING THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Jacques Sigwald, Frepillon, and Michel Achard, La Garenne Colombes, both of France, assignors to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed May 5, 1978, Ser. No. 903,131

Claims priority, application France, May 11, 1977, 77 14416

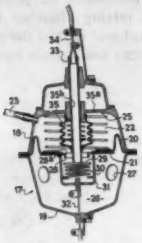
Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **10 Claims**

1. A device for regulating the flow of exhaust gas re-cycled in the induction pipe of an internal combustion engine, comprising an induction pipe of the engine, a depression take-off orifice in the induction pipe, throttling means in the induction pipe, an exhaust pipe of the engine, a re-cycling passageway interposed between and interconnecting the induction pipe and exhaust pipe, a valve for regulating the flow of re-cycled gas inserted in the re-cycling passageway between the exhaust pipe and the induction pipe, the regulating valve comprising a closure member for said passageway, and control means for controlling the regulating valve and comprising a depression case comprising a movable wall which is

movable relative to the depression case, first connecting means connecting the movable wall to the closure mem-

ber for shifting the closure member upon movement of the movable wall relative to the depression case, a first chamber and a second chamber defined within the case by the movable wall on opposite sides of the movable wall, the second chamber communicating with the atmosphere, the movable wall of the depression case comprising a seat which is movable with the movable wall relative to the depression case and defines an opening which puts the first chamber in communication with the second chamber, a valve member movably mounted in the depression case



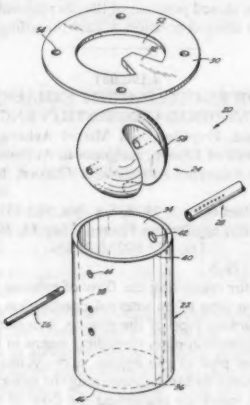
and cooperative with the seat for selectively opening and closing said opening, a rod movably mounted on the depression case, second connecting means connecting the rod to the throttling means to shift the rod by movement of the throttling means, and a spring which biases the valve member against said seat to close said opening, the rod being operative on the valve member to shift the valve member away from the seat, in opposition to the action of the spring, when the throttle is closed, and to allow the valve member to be shifted toward the seat by the action of the spring when the throttle is opened.

4,190,032

FLOW HOMOGENIZER

Albert T. Wright, 4 Palmer Ave., Corinth, N.Y. 12822

Filed Nov. 29, 1978, Ser. No. 964,471
Int. Cl.[2] F02M *7/22*
U.S. Cl. 123—141 **12 Claims**



1. A flow homogenizer for an internal combustion engine comprising:

a hollow housing open at both ends;

a first tube extending through the walls of the housing and adapted to be connected to a fuel source;

a second tube concentrically mounted on the first tube in tight fitting relationship but being able to rotate about the first tube;

the first tube having at least one slot therein in the portion thereof in the housing and the second tube having a plurality of holes therein in a predetermined arrangement and positioned so that as the second tube rotates relative to the first tube the number of holes exposed to each slot can be changed thereby controlling the size of opening for fuel to flow through the tubes into the housing;

a damping member mounted on the second tube in the housing to rotate therewith and the damping member having a recess in a surface portion thereof to expose the opening in the second tube and to open the passageway through the housing from end to end;

the damping member being rotatable between a closed position blocking the opening between the ends of the housing and opened positions exposing the recess and the damping member to both ends of the housing;

the opened positions coordinated with the number of holes to the slot as the damping member is rotated thereby facilitating close control of the fuel and air mixture passing through the housing;

the homogenizer adapted to be connected to a source of vacuum for drawing the fuel and air mixture therethrough;

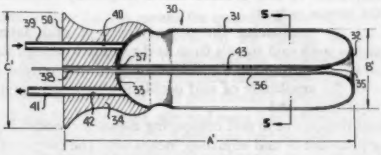
means on the homogenizer for attachment to control means for rotating the second tube and damping member in a desired manner to control fuel and air mixture parameters.

4,190,033

CLOSED FLOW CALORIC TEST METHOD

Thomas M. Foti, 10937 Deborah Dr., Potomac, Md. 20854

Continuation of Ser. No. 771,340, Feb. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 734,291, Oct. 21, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,718
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—742 **4 Claims**



1. The method of caloric vestibular testing comprising:

(a) inserting a flexible, thin-walled, distensible receptacle into an ear canal, the receptacle having provision for enabling circulation of pressurized calorized fluid therethrough and being inflatable by such fluid;

(b) admitting pressurized calorized fluid into the receptacle to cause its expansion laterally within the ear canal and longitudinally up to the tympanic membrane, such expansion filling the cross sectional area of at least a portion of the ear canal;

(c) while inflating the receptacle, venting air trapped between the receptacle and the tympanic membrane to atmosphere; and

(d) circulating a volume of calorized fluid through the receptacle for a time period and at a temperature consistent with and while carrying out a caloric vestibular function testing procedure.

4,190,034

APPARATUS FOR STARTING AND FANNING A FIRE

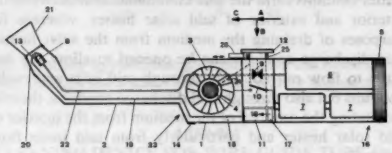
Franz Wonisch, Arnsberg, Fed. Rep. of Germany, assignor to Mayer & Wonisch Spezialfabrik fuer Mess- und Regelgeraete, Arnsberg, Fed. Rep. of Germany

Filed Feb. 7, 1978, Ser. No. 875,859

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706762

Int. Cl.[2] F24B 3/00; F23Q 7/12

U.S. Cl. 126—25 B 14 Claims



1. An apparatus for igniting and fanning a fire, comprising hollow housing means, fuel gas nozzle means in said hollow housing means, battery operated fan means in said hollow housing means, ignition means arranged to ignite fuel gas emerging from said fuel gas nozzle means, manual control means arranged in said hollow housing means and operatively connected to said ignition means, and to said fan means for activating the just mentioned components for a predetermined cooperation wherein said ignition means comprise piezoelectric crystal means (11) located substantially centrally in said housing and operable through force applying means responsive to said control means, said manual control means including gas closure valve means (9) operatively interposed in the gas supply line (22) between said fuel gas nozzle means (8) and a gas supply source (6), said manual control means further including two position switch means (10) operatively interposed between an electric motor of said fan means and a source of power (7) for said fan means, said manual control means further including a mechanical actuating member (12) operatively connected to said piezo-electric crystal means (11), to said valve means (9), and to said two position switch means (10), said apparatus further comprising mechanical air intake means (4) for adjusting the air supply to said battery operated fan means (3).

4,190,035

FLUID HEATER

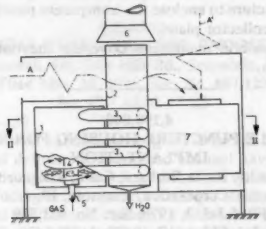
Gerardus L. Beusen, v. Twillerstraat 25, Nijkerk, Netherlands

Filed Oct. 25, 1977, Ser. No. 845,054

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649174

Int. Cl.[2] F24H 3/06

U.S. Cl. 126—99 A 10 Claims



1. A device for heating fluids comprising:

a housing;

a combustion chamber positioned within said housing having means for igniting and burning fuel;

a chimney positioned within said housing for removing combustion products from said combustion chamber;

substantially curved channels positioned within said housing for interconnecting said combustion chamber and said chimney in such manner that combustion products are conveyed directly from said combustion chamber to said chimney, said combustion chamber and said chimney being located next to each other with all of said channels being substantially tangential to said chimney, said combustion chamber and chimney having exterior heating surfaces positioned inside said housing; and

means for moving a fluid over substantially the entire heating surfaces of said combustion chamber and said chimney.

4,190,036

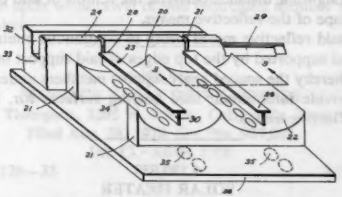
SOLAR ENERGY COLLECTOR-LIGHT EMITTING PANEL

William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301

Filed Aug. 29, 1977, Ser. No. 828,496

Int. Cl.[2] F24J 3/02

U.S. Cl. 126—439 2 Claims



1. In a solar energy concentrating collector, at least one parabolic reflective surface and at least one heat absorbing conductor means disposed in operative relation to said parabolic reflective surface, said heat absorbing conductor means arranged to absorb heat energy from solar rays directed thereto by the parabolic reflective surface, said heat absorbing conductor means having a surface treated to reflect visible portions of the solar rays back toward the said parabolic reflective surface, apertures in said parabolic reflective surface through which visible portions of the solar rays reflected from the treated surface of the heat absorbing conductor means may travel, and a contact surface behind the parabolic reflective surface against which the visible portions of the solar rays impinge whereby to illuminate portions of the said contact surface.

4,190,037

SOLAR ENERGY COLLECTOR

William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301

Filed Aug. 29, 1977, Ser. No. 828,497

Int. Cl.[2] F24J 3/02

U.S. Cl. 126—438 9 Claims

1. A solar energy collector including;

a heat collector means,

a reflective means which is a single flexible sheet of longitudinal parabolic configuration arranged to collect, concentrate, and direct solar rays toward the heat collector means,

heat transfer fluid in contact with said collector means at a distance from said reflective means,

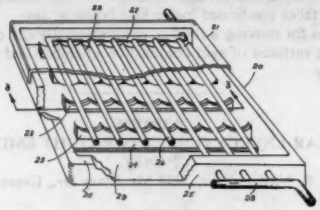
said collector means being conductive and coated with absorptive means for improving heat transfer to said heat transfer fluid, and arranged co-incident with the focal line of a parabolic curve, said curve calculated according to any value of P in formula $X^2=2Py$,

a plurality of non-conductive support members disposed in

full contacting transverse relationship with said reflector means from zenith to zenith of same, and being spaced from each other,

said support members having major planar surfaces disposed in transverse relationship to the axis of the reflector means,

said planar surfaces each having a bottom edge and a top edge, said top edges being parabolic in shape, the projection of said bottom edge having a length equal to a straightline distance between the zeniths of said parabolic shape of the reflective means,



the said reflective means being in continuous contact with and supported by the top edges of said support members, whereby the spaced apart support members underlie, and provide intermittant load bearing surfaces for, the said reflective means.

4,190,038

SOLAR HEATER

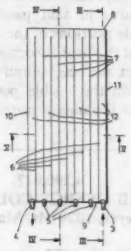
Herbert Heitland; Rudolf Kroll, and Edgard Grundmann, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,652

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648114

Int. Cl.² F24J *3/02*

U.S. Cl. 126—445 **8 Claims**



1. A mat-shaped solar heater comprising:

(a) means forming two outer and a plurality of inner parallel flow channels for a heat-carrying medium all of which flow channels are in communication with each other, any two adjacent ones of said flow channels having a common linear divider, at least every other one of said dividers terminating short of an edge of said mat-shaped solar heater so as to form a plurality of pairs of two adjacent inner flow channels which communicate with each other near said edge;

(b) inlet and outlet conduits communicating with the interior of said inlet and being in general alignment and therefore in direct communication with said two outer flow channels, respectively, for allowing heat-carrying medium to be introduced into and to flow out of all of said flow channels during normal operation of the solar heater, and;

(c) means forming a plurality of closable discharge conduits which communicate with the interior of said solar heater in the region of said edge thereof, each of said closable discharge conduits being in general alignment and therefore in direct communication with two flow channels which constitute a respective pair of adjacent inner flow channels so that when said discharge conduits are closed during normal operation of the solar heater, said inlet and outlet conduits form the sole communication between the interior and exterior of said solar heater, whereas for purposes of draining the medium from the solar heater, said discharge conduits can be opened to allow the medium to flow out not only through said inlet and outlet conduits but also through said discharge conduits, thereby facilitating the removal of the medium from the interior of said solar heater and particularly from said inner flow channels.

4,190,039

SOLAR ENERGY LIQUID HEATING DEVICE

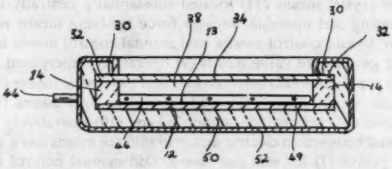
David A. Zani, P.O. Box 165, Kingshill, St. Croix, V.I. 00850

Filed Apr. 17, 1978, Ser. No. 896,997

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.² F24J *3/02*

U.S. Cl. 126—450 **3 Claims**



1. A solar energy liquid heating device comprising:

a. a collector plate;

b. a wall member extending perpendicular from the plane of the collector plate;

c. a panel having a peripheral portion bearing against a wall member to form an enclosure, said panel having a transparent central portion capable of transmitting solar energy therethrough;

d. a heat absorbing surface within the enclosure, the wall member of the enclosure having apertures whereby liquid can be passed therethrough during use to extract solar energy absorbed in the enclosure; and

e. insulation covering the outside of the enclosure excepting said transparent central portion of the panel to form a rigid structure to enclose the transparent panel, wall member and collector plate,

f. an elastomeric membrane covering the outside of the insulation.

4,190,040

RESEALABLE PUNCTURE HOUSING FOR SURGICAL IMPLANTATION

Rudolf R. Schulte, Santa Barbara, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

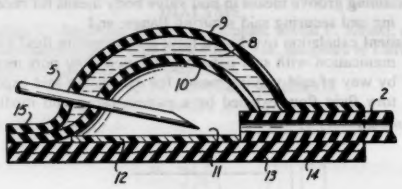
Filed Jul. 3, 1978, Ser. No. 921,559

Int. Cl.² A61B *19/00*; A61F *1/00*

U.S. Cl. 128—1 R **11 Claims**

1. A housing for surgical implantation having an encased sealant for repairing hypodermic punctures, wherein the improvement comprises: a generally dome shaped sealant layer sandwiched between inner and outer wall portions of the

housing; and the wall portions are domed in a common direction to provide a reservoir chamber under the domed inner



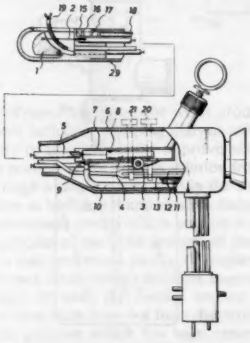
wall, whereby hypodermic punctures into the housing can be made through the sealant layer from widely angled positions.

4,190,041

CLEANING DEVICE FOR WIRE GUIDE TUBE IN AN ENDOSCOPE

Toshio Chikama, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1977, Ser. No. 832,338
Int. Cl.² A61B *1/00*
U.S. Cl. 128—4 **9 Claims**



1. An endoscope having a handle and an operating end interconnected by a sheath, a liquid tube means carried within said sheath for carrying air and liquid, a wire guide tube carried within said sheath housing a guide wire, said guide wire extending from a handle end to a pivoted deflector at said operating end, said guide tube being open at said operating end and being open at said handle end so that said guide tube is open at both its ends, and cleansing means communicating with said open handle end of said wire guide tube enabling cleansing of the interior of said wire guide tube.

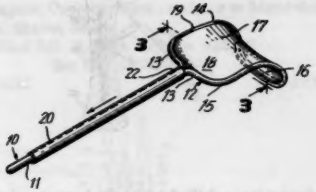
4,190,042

SURGICAL RETRACTOR FOR ENDOSCOPES

Manfred Sinnreich, 160 Fort Hill Rd., Scarsdale, N.Y. 10583

Filed Mar. 16, 1978, Ser. No. 887,120
Int. Cl.² A61B *17/02*
U.S. Cl. 128—20 **3 Claims**

1. An improved collapsable surgical retractor comprising: a hollow barrel defining an elongated channel having proximal and distal ends; a unitary molding of resilient synthetic resinous material including an elongated rectilinear shaft member slidably disposed within said channel, a bifurcated member on a distal end of said shaft, selectively positionable within said channel and having a relatively unstressed configuration when positioned outwardly of said channel, said bifurcated member including a plurality of interconnected segments having inwardly and outwardly directed peripheral surfaces, and defining a hook-like appendage of substantial transverse width, and forming an angle with respect to the axis of said shaft member, said segments defining an at least partially enclosed area; and a thin web-like membrane interconnecting the inwardly directed surfaces of said bifurcated member, and extending over said enclosed area; whereby when said bifurcated member is positioned completely within said channel, it assumes a rectilinear



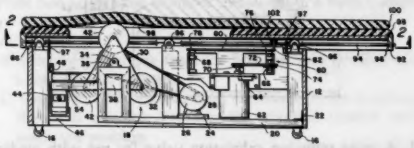
configuration, and when extended outwardly past said distal end of said channel, said bifurcated member resiliently expands to relatively unstressed operative configuration, said membrane being thereby tensed to prevent the accidental entry of tissue into said enclosed area, and preventing the pinching of said tissue upon withdrawal of said bifurcated member within said channel.

4,190,043

MASSAGE TABLE DRIVE SYSTEM

Terry D. Thompson, 2205 W. 8th St., Coffeyville, Kans. 67337

Filed Aug. 28, 1978, Ser. No. 937,207
Int. Cl.² A61H *1/00*
U.S. Cl. 128—33 **3 Claims**



1. An improved drive system for a massage table which includes a cabinet housing having an open top area, massage means formed to said housing, and a massage table top having an upper side for allowing a patient to be supported thereon and a lower side and wherein said system comprises motor means formed within said housing; gear reduction means connected to and powered by said motor means; a continuous chain formed from a plurality of links moved by said gear reduction means such that the path of said chains forms a plane; an upwardly extending ear link in said chain to act as a driver for said table top; a transverse bracket slot on said lower side of said top for receiving said ear link therein; a plurality of removable parallel drill rods extending longitudinally across and spaced from said lower side; a plurality of security brackets extending from said open top area of said housing, each bracket having an opening to accept a drill rod therethrough; and a plurality of caster means extending from said open top area and aligned in a plane parallel to said plane of said chain to allow said table top to slide reciprocally longitudinally thereon.

4,190,044

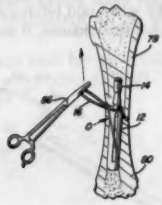
TELESCOPING INTERMEDULLARY PIN

Eugene W. Wood, P. O. Box 672, Magnolia, Ark. 71753

Filed Aug. 16, 1978, Ser. No. 933,990
Int. Cl.² A61F *5/04*; A61B *17/18*
U.S. Cl. 128—92 BC **9 Claims**

7. An intermedullary pin device for use in setting bone fractures comprising: a base with a plunger telescopingly re-

ceived therein, said base being adapted to be received within a drilled out cavity in one section of said fractured bone; a flexible extension means connected to said plunger for extending



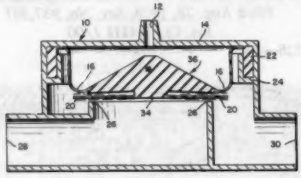
said plunger into a drilled out cavity in a second section of said fractured bone, said extension means being formed in a loop and being accessible externally of the bone.

4,190,045

NOISE REDUCING EXHALATION VALVE AND DIAPHRAGM

Harold U. Bartels, Corona, Calif., assignor to Bourns Medical Systems, Inc., Riverside, Calif.

Filed Apr. 24, 1978, Ser. No. 899,604
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—205.24 **2 Claims**



1. A noise reducing exhalation valve for use with medical respiratory systems comprising:

valve body means;

patient exhalation flow port means in said valve body means for accepting expiratory fluid flow from a patient using said medical respiratory system;

valving means in said valve body means in fluidic communication with said patient exhalation flow port means to control fluid flow by permitting and restricting said expiratory fluid flow therethrough;

operating control pressure chamber means in said valve body;

operating pressure inlet port means communicating with said operating control pressure chamber means for admitting fluid operating pressures to said valve body means for controlling said valving means;

said valving means including a valve seat in said patient exhalation flow port means and an integrally molded diaphragm means in said valve body means responsive to said fluid operating pressures supplied by way of said operating pressure inlet port means and operable with said valve seat to open and close said valving means, said diaphragm means and said body means defining said operating control pressure chamber means, said integrally molded diaphragm means comprising:

a cone-shaped central portion;

a cylindrical boss, one base of which is integrally molded onto the flat surface of said cone-shaped central portion;

a thin circular sheet integrally molded to the other base of said cylindrical boss;

a flexible extension integrally molded to the periphery of said cone-shaped central portion;

a securing flange integrally molded to the periphery of said flexible extension;

retaining groove means in said valve body means for receiving and securing said securing flange; and

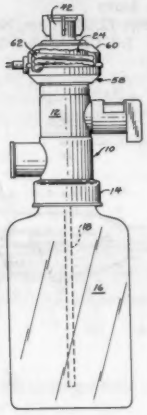
patient exhalation overboard flow port means in fluid communication with said patient exhalation flow port means by way of said valving means for exhausting said expiratory fluid flow exhaled by a patient using said medical respiratory system.

4,190,046

NEBULIZER CAP SYSTEM HAVING HEATING MEANS

Robert A. Virag, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 10, 1978, Ser. No. 885,240
Int. Cl.[2] A61M *11/02*
U.S. Cl. 128—200.21 **4 Claims**



1. A nebulizer cap useful for respiratory therapy comprising:

a cap body;

means for connecting the cap body to a container for holding liquid to be nebulized;

a dip tube carried by the cap body in a position to extend into the container when the cap body is attached thereto;

conduit means, including a continuous open channel defined in the surface of an upstanding portion of the cap body, having one end connected to said dip tube for transmitting liquid from the dip tube through the cap body;

liquid inlet means connected to the other end of said conduit means for delivering liquid being transmitted through the conduit means to a prescribed point in the cap body;

a gas port defined in the cap body for transmitting gas into the cap body from an exterior source;

gas inlet means connected to said gas port for delivering gas from the gas port into the cap body adjacent the prescribed point of liquid delivery, the gas and liquid inlets means being arranged to define a nebulizing venturi, whereby liquid from the liquid inlet is sucked into and mixed with the gas being delivered from the gas inlet;

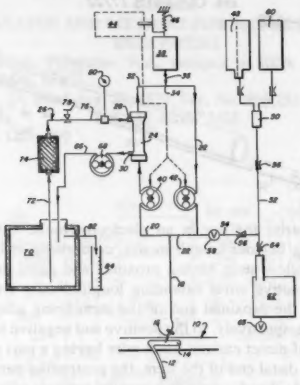
a metal heat exchange shell positioned over the upstanding portion of the cap body, thereby essentially enclosing the open channels to heat liquid passing through the channels; and

outlet means in said cap body through which the nebulized mixture is exhausted from the cap body.

4,190,047
METHOD AND APPARATUS FOR PERITONEAL DIALYSIS

Stephen C. Jacobsen; Robert L. Stephen; David F. Knutti, and Carl Kablitz, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Aug. 26, 1977, Ser. No. 828,073
Int. Cl.[2] A61M 5/00, 1/03
U.S. Cl. 128—213 A 11 Claims

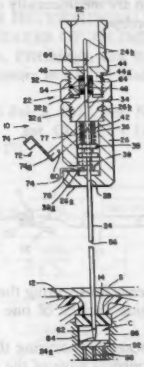


1. A method of removing metabolic waste products from the blood of a patient including pumping dialysis solution into the peritoneal cavity of the patient, the improvement comprising (a) removing a portion of the dialysis solution from the peritoneal cavity through a single access path in the abdominal wall to the peritoneum to both insert and remove dialysis solution to and from the peritoneal cavity which portion is no more than essentially 90 percent of the total amount of dialysis solution administered to said peritoneal cavity, (b) replacing said portion with additional, fresh dialysis solution, sequentially repeating steps (a) and (b) until the desired amount of metabolic waste products have been removed from the patient, (c) dialyzing said dialysis solution which has been removed from the peritoneal cavity against a second dialysis solution for removal of metabolic waste products therefrom, (d) returning said removed dialysis solution to the peritoneal cavity of the patient as cleansed dialysis solution, (e) passing said second dialysis solution through absorbent means to regenerate said second dialysis solution for further dialysis against the dialysis solution removed from the peritoneal cavity, (f) directing said dialysis solution into and out of the peritoneal cavity in the manner responsive to the weight of dialysis solution in a reservoir positioned in flow communication with the peritoneal cavity, flowing said dialysis solution into and out of the peritoneal cavity of a patient through a flow circuit which defines communication means with said catheter, (g) providing first and second branch conduits positioned in branched relationship with said connection means, a primary circuit having one end connected to said first conduit and another end connected to said second conduit, said primary circuit passing through pump means and dialyzer means for purification of the solution, said first branch conduit communicating with a third branch conduit, upstream of said pump, which in turn communicates with a reservoir for dialysis solution, said second branch conduit being in flow communication with a fourth branch conduit, said fourth branch conduit also communicating with said reservoir; and valve means for alternatively opening and closing fluid flow through pairs of branch conduits, said pairs of branch conduits comprising respectively the first and fourth and the second and third branch conduits, whereby flow of dialysis solution takes place through only one pair of said branch conduits on an alternative basis, to permit the withdrawal of dialysis solution from the peritoneal cavity and the storage thereof in said container when the second and third branch conduits are open, and to permit the reinfusion of dialysis solution from the container to the peritoneal cavity when the first and fourth branch conduits are open.

4,190,048
INFUSATE INJECTION APPARATUS

Edward J. Sampson, Concord, Mass., assignor to Metal Bellows Corporation, Sharon, Mass.

Filed Jul. 14, 1978, Ser. No. 924,623
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—215 3 Claims



1. Apparatus for injecting infusate percutaneously through a septum into an infusate chamber implanted in a body comprising:

A. a housing,

B. a needle projecting from the housing, said needle having a longitudinal passage,

C. means for slidably mounting the needle in the housing so that it is movable between an extended positon and a retracted position,

D. means for biasing the needle toward its extended position,

E. means for conducting fluid into the housing, and

F. valve means in the housing for controlling the flow of fluid from the housing into the needle, said valve means being closed when the needle is in its extended position and said valve means being open when the needle is in its retracted position whereby fluid infusate cannot flow through the needle unless the exposed end of the needle bottoms against a stop in the chamber thereby facilitating moving the needle to its retracted position, said valve means comprising:

1. a transverse passage through the needle near its inner end, said transverse passage intercepting the longitudinal passage through the needle, and

2. a resilient seal mounted in the housing so as to cover the ends of said transverse passage when the needle is in its extended position, the ends of said transverse passage being free of said seal when the needle is in its retracted position.

4,190,049
POSTERIOR LENS IMPLANT TOOL

Clarence L. Hager, 16037 Miami Way, Pacific Palisades, Calif. 90272, and Ronald P. Jensen, 4156 Dorset Pl., Pasadena, Calif. 91103

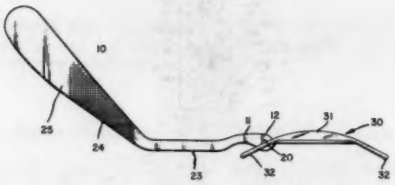
Filed Aug. 8, 1977, Ser. No. 822,511
Int. Cl.[2] A61F 9/00, 1/16
U.S. Cl. 128—303 R 2 Claims

1. A posterior lens implant tool for use in combination with an intraocular lens for implantation in the posterior chamber of a human eye, said intraocular lens including:

a. a plano-convex lens, which is formed from an optical material that is suitable for an implantable lens, which is adapted to be inserted into the posterior chamber of the human eye within the capsular membrane thereof; and

b. a pair of supporting loops, which are formed from a material that is suitable for implantation into the eye, mechanically coupled to the peripheral edge of the plano-convex lens and disposed at an angle in the range of 0° to 25° to the plane surface of said plano-convex lens so that their end portions are below the plane surface of said plano-convex lens; said implant tool comprising:

a. pair of prongs each of which has a tip and an adjacent section and which are mechanically coupled in order to form a pair of forceps;



b. a first grooved means for securing the tip of each of said prongs to the inside surface of one of the supporting loops; and

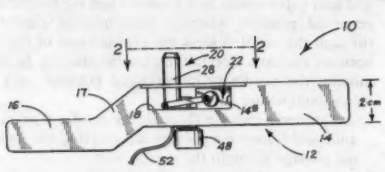
c. second groove means for securing the tip of each said prongs to the peripheral edge of the plano-convex lens whereby each of said prongs is adapted so that its said tip may be inserted into one of the supporting loops and its said adjacent section may extend parallelly to the plane surface of the plano-convex lens substantially in the same plane as the plano-convex lens so that no portion of its said adjacent section extends above or below the intraocular lens.

4,190,050

TREPHINE INSTRUMENT FOR USE IN CORNEA REMOVAL AND TRANSPLANT

Paul F. Bailey, 4885 NW. Barnes Rd., Portland, Oreg. 97210

Filed Jul. 28, 1977, Ser. No. 819,884
Int. Cl.² A61B *17/16*
U.S. Cl. 128—305.1 **16 Claims**



1. A trephine instrument for use in surgical removal of a cornea comprising:

elongate handle means for gripping by a surgeon with both hands when in use including first and second handle portions having their longitudinal axes laterally spaced and longitudinally offset from one another, said first and second handle portions being joined together by an interconnecting portion;

guide means mounted on said first handle means portion including a concave end face dimensioned for seating against a cornea;

blade means having an annular cutting edge mounted on said guide means and extending outwardly from said first handle portion;

power-driven means operable for selectively imparting cutting motion to said blade means; and

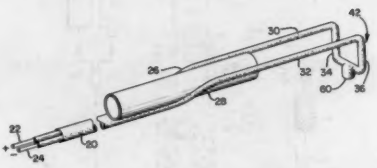
shifting means mounted on said handle means selectively operable for extending and retracting said blade means relative to said handle means.

4,190,051

LITHOTRITE FOR ELECTROHYDRAULIC CYSTOLITHOTRIPSY

Jose J. Iglesias, 1341 North Ave., Elizabeth, N.J. 07603

Filed Jun. 6, 1978, Ser. No. 913,112
Int. Cl.² A61B *17/22*
U.S. Cl. 128—328 **3 Claims**



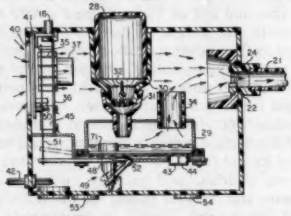
1. A lithotrite for use in an electrohydraulic system for disintegrating bladder calculi in situ, comprising at least one elongated hollow stem having proximal and distal ends, two electro-conductive wires extending longitudinally within the stem and at the proximal end of the stem being adapted for connection, respectively, to the positive and negative terminals of a source of direct current, each wire having a part protruding from the distal end of the stem, the protruding parts of the wires being rigid and comprising parallel sections adjacent the distal end of the stem and parts depending from the parallel sections distal to the distal end of the stem, the depending part of one wire being formed at its lower end as a horizontal open loop, the depending part of the other wire being vertical with its lower end within and concentric with the open loop of the one wire, and electrical insulating material surrounding all parts of the wires distal of the stem except only the lower surface of the open loop and the lower end surface of the other wire which is within and concentric with the open loop.

4,190,052

STEAM FACIAL APPARATUS

Edward F. McCarthy, Medford, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 18, 1978, Ser. No. 970,748
Int. Cl.² A61H *33/00*
U.S. Cl. 128—368 **12 Claims**



1. A facial treatment apparatus comprising

housing means including a plurality of air vents and a steam exit means;

steam generator means positioned in said housing means and including a heater assembly and a boiler for generating steam, said boiler including a steam exit means for releasing steam from said boiler for combination with air in said housing to said steam exit means;

air moving means positioned in said housing means and proximate said vents for drawing air through said vents

and creating a pressure increase in said housing means and in said boiler through said steam exit means; and

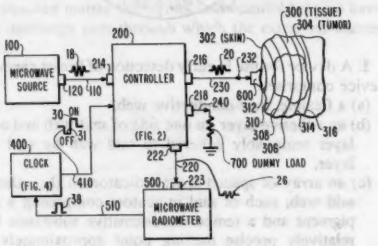
a fill means including a one-way valve positioned in said fill means, connected to said boiler for providing fluid communication to said boiler and for substantially preventing fluid communication to said boiler when said air moving means creates a pressure increase in said boiler or when steam is generated in said boiler.

4,190,053

APPARATUS AND METHOD FOR HYPERTHERMIA TREATMENT

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,292
Int. Cl.² A61N *5/02*
U.S. Cl. 128—399 **10 Claims**



1. Apparatus for heating living tissue with microwave signals and detecting radiant energy from that tissue comprising:

a. source means for providing irradiating microwave signals at a selected frequency and intensity;

b. means for coupling said microwave signals to irradiate said living tissue to thereby increase the heat energy and thereby the temperature of said tissue;

c. means to interrupt the coupling of said signals to said tissue; and

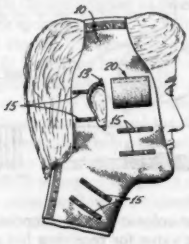
d. detecting means coupled to said tissue to detect radiant energy related to said frequency from said tissue only when said microwave irradiation signals to said tissue are interrupted, said radiant energy being indicative of the temperature of said tissue.

4,190,054

THERAPEUTIC BANDAGE WITH REMOVABLE HOT OR COLD PACKS

H. George Brennan, 10800 Ambazac Way, Bel Air, Calif.

Filed Dec. 14, 1977, Ser. No. 860,327
Int. Cl.² A61F *7/00*
U.S. Cl. 128—402 **2 Claims**



1. An article of manufacture comprising:

a removable bandage attachable to a body part for covering same, said bandage being made from an elastic material so as to hold the flesh of said body part firmly in place;

a flexible fluid retaining envelope, the fluid therein being heatable and coolable so that said envelope functions as a hot or cold pack; and

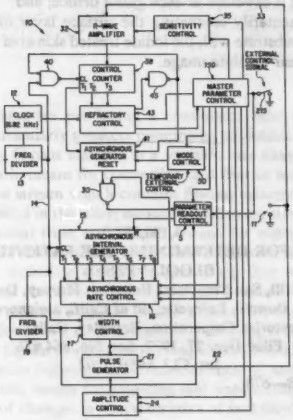
means provided on the outside surface of said bandage for removably and selectively attaching said envelope to said outside surface of said bandage without moving the inside surface thereof out of contact with said body part to apply heat or cold to said body part.

4,190,055

CIRCUIT FOR DETERMINING THE PARAMETER CONTROL STATES OF AN IMPLANTED PACER

Robert A. Walters, Pittsburgh, and Russell E. Hirtz, Arnold, both of Pa., assignors to ARCO Medical Products Company, Leechburg, Pa.

Filed Jul. 5, 1977, Ser. No. 812,571
Int. Cl.² A61N *1/00*
U.S. Cl. 128—419 PT **7 Claims**



1. In combination with a heart pacer of the type in which operating parameters of the pacer are controlled by logic states established in a register connected to parameter controlling circuitry and having an externally selectable asynchronous mode in which said pacer produces asynchronously occurring stimulation pulses,

means for producing serial logic states corresponding, in order, to each of said established logic states, and

a delay circuit for selectively adding, in correspondence with the logic state of a respective one of said serial logic states, a delay between successive asynchronous stimulation pulses to provide an observable indication of said established logic states when said asynchronous mode of said pacer is selected.

4,190,056

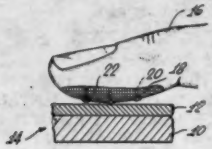
METHOD AND MEANS FOR RECORDING SWEAT GLAND ACTIVITY

Robert Tapper, West Los Angeles; Arthur S. Diamond, Ventura, and Ajit S. Arora, San Francisco, all of Calif., assignors to General Medical Company, Los Angeles, Calif.

Filed Oct. 31, 1977, Ser. No. 846,800
Int. Cl.² A61B *5/00*
U.S. Cl. 128—630 **99 Claims**

1. A method for recording sweat gland activity by obtaining a clear resolute image which is directly proportional to the amount of perspiration exuded at each sweat gland orifice, the method comprising the steps of:

(a) providing a dry sensitized substrate having a surface layer comprising a mixture of a starch and an oxidizing agent;
(b) treating a skin area to be recorded with an iodide solution of a compound selected from the group consisting of sodium iodide, calcium iodide, potassium iodide and mixtures thereof;



(c) allowing the iodide treated skin area to dry in areas where no perspiration exists and to receive perspiration where it develops at each gland orifice; and
(d) momentarily contacting the surface layer of the sensitized substrate with the iodide treated skin area to produce the clear resolute image.

4,190,057

DEVICE FOR DETERMINING THE PATENTCY OF A BLOOD VESSEL

J. Donald Hill, San Francisco; Robert J. Harvey, Danville, and David E. Downie, Lafayette, all of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed Dec. 27, 1977, Ser. No. 864,626
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—675 **2 Claims**

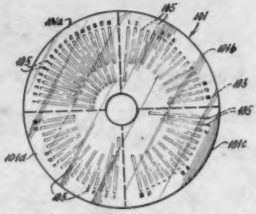
1. A device for determining the patentcy of a blood vessel comprising a physiologically inert, implantable flexible bulb closed except for a first opening; inexpansible means for securing said bulb in motion transferring relationship to the wall of a blood vessel; a physiologically innocuous, implantable reservoir closed except for a second opening; and a physiologically inert, implantable catheter at one end secured to said bulb and communicating therewith through said first opening and at the other end secured to said reservoir and communicating therewith through said second opening, said reservoir having a wall which is made of a material having the property of permitting the passage therethrough of a hypodermic needle and having the property of self-sealing upon the withdrawal therefrom of a hypodermic needle.

4,190,058

DEVICE FOR USE IN EARLY DETECTION OF BREAST CANCER

Zsimond L. Sagi, Denville, N.J., assignor to Arden Industries, Inc., Lake Hiawatha, N.J.

Filed May 22, 1978, Ser. No. 908,154
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—736 **12 Claims**



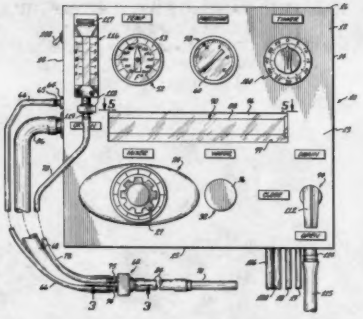
1. A device for use in early detection of breast cancer, which device comprises:
(a) a flexible, heat-conductive web,
(b) an adhesive layer on one side of said web and a pealable layer removably adhered to said web by said adhesive layer,
(c) an array of spaced-apart indicatorson the other side of said web, each of said indicators comprising a dye or a pigment and a temperature-sensitive substance having a relatively precise melting point approximately 0.5° F. different from the melting point of the temperature-sensitive substance in the adjacent indicator, and wherein each indicator displays a change in color upon melting of each of said temperature sensitive substance, and
(d) a transparent flexible layer conformably overlying said web and sealably secured thereto for visual examination of the change in color of said indicators.

4,190,059

APPARATUS FOR COLONIC LAVAGE AND SPECIMEN COLLECTION

Gregory G. Holt, Phoenix, Ariz., assignor to Colonics Diversified, Inc., Scottsdale, Ariz.

Filed Oct. 25, 1978, Ser. No. 954,352
Int. Cl.[2] A61B *10/00*; A61M *7/00*
U.S. Cl. 128—750 **22 Claims**



1. An apparatus for colonic lavage comprising:
(a) a water mixing valve for receiving hot and cold water under pressure and mixing them to arrive at a desired temperature, said mixing valve having an outlet port;
(b) water pressure regulating valve means coupled to the outlet port of said water mixing valve for receiving water

therefrom, said water pressure regulating valve means having an outlet and including first valve means for limiting the maximum pressure of the water at its outlet and second valve means for adjusting the water pressure to specific valves below that maximum limit;

(c) a water temperature gage coupled to the outlet of said water pressure regulating valve means to provide a visual indication of the water temperature;

(d) a water pressure gage coupled to the outlet of said water pressure regulating valve means to provide a visual indication of the water pressure at the outlet of said water pressure regulating valve means;

(e) a speculum for insertion into the anal canal of a patient for lavaging the patient's colon and extracting matter lodged therein; and

(f) manifold means connected between the outlet of said water pressure regulating valve means and said speculum for delivering water to said speculum and for receiving the extracted matter therefrom, said manifold means having a discharge port through which the extracted matter passes.

4,190,060

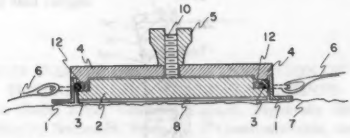
SWEAT COLLECTION CAPSULE

John E. Greenleaf, Sunnyvale, and Robert W. Delaplaine, Woodside, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1978, Ser. No. 897,828

Int. Cl.² A61B *10/00*

U.S. Cl. 128—760 **4 Claims**



1. A capsule for collecting sweat from the skin of a human subject, which comprises:

(a) a frame;

(b) a removable closure adapted to mount on the frame and which, when mounted, leaves a cavity on one side of the frame; said closure comprising (1) a circular base plate adapted to fit within the frame and having a rod protruding perpendicularly from its center; (2) an O-ring for placement on the rod side of the base plate; (3) a cover plate for placement on top of the O-ring and the base place, said cover plate being centrally perforated to accommodate the rod of the base plate; and (4) a locking device operable to engage the rod of the base plate in such a way as to cause the O-ring to expand beyond the perimeter of the base plate and push against the frame in airtight cooperation;

(c) means for absorbing sweat, located within said cavity; and

(d) means for attaching the frame to the skin in an immobile and airtight manner.

4,190,061

METHOD AND APPARATUS FOR PRODUCING A ROD-LIKE TOBACCO FILLER

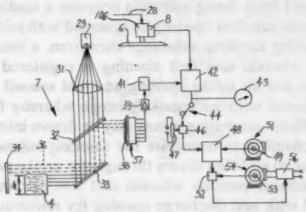
Uwe Heitmann, Schwarzenbek; Wolfgang Steiniger, Börnsen; Uwe Holznagel, Glinde; Hartmut Kaebernick; Joachim Pfannmüller, both of Hamburg, and Joachim Reuland, New Börnsen all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Aug. 2, 1977, Ser. No. 821,179

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635391

Int. Cl.² A24C *5/14, 5/39*

U.S. Cl. 131—21 B **13 Claims**



7. Apparatus for producing a continuous filler of fibrous material, particularly tobacco, comprising adjustable means for transporting fibrous material at a variable rate along a predetermined path; means for converting said fibrous material into a continuous stream which contains fibrous material in excess of that required in the filler; means for removing the surplus of fibrous material from said stream; means for monitoring the height of said stream ahead of and downstream of said removing means, including means for generating first and second signals whose characteristics respectively denote the height of said stream prior to removal of said surplus and the height of the remainder of said stream; means for deriving from said first and second signals third signals having characteristics denoting the differences between the characteristics of said first and second signals; means for adjusting said transporting means as a function of changes in characteristics of said third signals so as to reduce said rate when the quantity of removed surplus increases and vice versa; and means for converting the remainder of said stream into said filler.

4,190,062

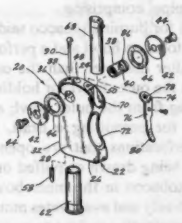
SMOKING DEVICE

Jack R. Paden, P.O. Box 80211, Lincoln, Nebr. 68501

Continuation-in-part of Ser. No. 837,899, Sep. 29, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,503

Int. Cl.² A24F *1/26, 3/00*

U.S. Cl. 131—180 **24 Claims**



1. A smoking device comprising,

a housing, said housing having a cavity for the storage of a smoking substance therein,

flame generating means in said housing, and

a bowl body rotatably supported in said housing and having a smoking chamber therein,

said bowl body having a first opening for the insertion and removal of smoking substance from said smoking chamber and a second opening small enough to substantially block the passage of smoking substance therethrough,

said housing having a smoking substance discharge opening in communication with said bowl body, a flame and air intake opening in communication with said bowl body and situated adjacent said flame generating means, and an elongated smoke passage in communication with the bowl body at one end and open at the other end for drawing smoke therethrough,

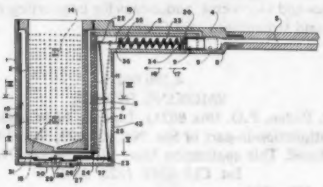
said bowl body being rotatable between a loading position wherein said first opening is registered with said cavity for receiving smoking substance therefrom, a smoking position wherein said first opening is registered with said flame and air intake opening and said second opening is registered with said smoke passage whereby flame from said flame generating means may be drawn into the smoking chamber to incinerate the smoking substance in response to air being drawn through the smoke passage, and a discharge position wherein said first opening is registered with said discharge opening for removing smoking substance from said chamber and housing.

4,190,063

SMOKER'S PIPE

Denver R. Turner, 405 Oakdale Ave., South Charleston, W. Va. 25303

Filed May 12, 1977, Ser. No. 796,136
Int. Cl.[2] A24F *1/02, 5/04*
U.S. Cl. 131—195 **3 Claims**



1. A smoker's pipe, comprising

a tobacco bowl for burning tobacco said tobacco bowl having an outer tobacco bowl and a perforated inner tobacco bowl of smaller diameter than the outer bowl coaxially positioned in the outer bowl for holding burning tobacco;

a stem extending from the outer bowl; and

control means for permitting a draft, wherein said inner bowl has perforations that are open when the control means is not being drawn or puffed on, via a free flow of air through tobacco in the inner bowl whereby the tobacco burns freely and evaporates moisture in the tobacco and eliminates nicotine and tar to provide a milder smoke when the pipe is free from drawing and puffing by a smoker, and for drawing smoke from burning tobacco in the inner bowl through the stem to the smoker's mouth said perforations of said inner bowl are closed when the smoker draws or puffs.

4,190,064

HAIR TREATMENT COMPOSITION AND METHOD OF TREATING HAIR WITH THE SAME

Harry W. Gordon, Bronx, and Sharif Amanat, Elmshurst Queens, both of N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,152
Int. Cl.[2] A45D *19/00*
U.S. Cl. 132—7 **25 Claims**

1. A method of treating hair, comprising the steps of:

(a) mixing henna material having a natural lawsone component and a natural fixer component in an aqueous-based carrier;

(b) mixing a glycol with the henna material in the carrier and thereby extracting quantities of the natural lawsone and fixer components from the henna material to thereby form a henna extract;

(c) mixing synthetic lawsone with the extract to thereby form a sub-mixture for increasing the color intensity imparted to the hair to a level above that imparted to the hair by the extracted natural lawsone component alone;

(d) mixing a cationic polymeric fixing agent with the sub-mixture to thereby form a hair treatment composition for fixing both the synthetic lawsone and the extracted natural fixer component to the hair in a time period which is shorter than the time required for the extracted natural fixer component alone to fix the extracted natural lawsone component to the hair; and

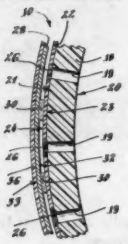
(e) applying the hair treatment composition to the hair for toning the same with the increased color intensity and in the shorter time period.

4,190,065

EXOTHERMIC HAIR CURLER

Walter J. Kulpa, Norwalk, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.

Filed Aug. 18, 1977, Ser. No. 825,638
Int. Cl.[2] A45D *2/12*
U.S. Cl. 132—33 R **30 Claims**



1. A laminated hair curler assembly comprising:

a. first sheet formed of a liquid impervious material and having a plurality of apertures formed in a thickness thereof;

b. a second non-perforated sheet formed of a liquid impervious material and sealed with said first sheet to provide an enclosure therebetween into which a reaction activating liquid can flow through said apertures;

c. a sheet of liquid absorbent material positioned between said first and second sheets;

d. means positioned between said absorbent sheet and said second sheet for creating an exothermic reaction when activated by a fluid in said enclosure;

e. means provided on said absorbent sheet for venting said exothermic reaction through said apertures; and

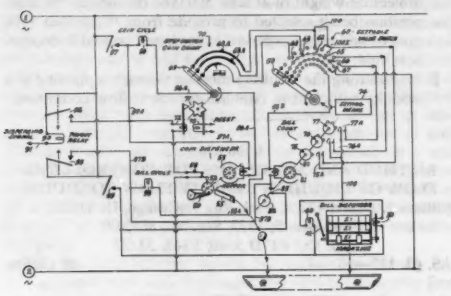
f. said assembly formed into an elongated body having an arc-shaped cross-sectional configuration.

4,190,066

COIN AND PAPER MONEY PAYOUT SYSTEM

Walter M. Burnside, Waukegan, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Dec. 27, 1977, Ser. No. 864,928
Int. Cl.² G07D 1/00
U.S. Cl. 133—4 R **8 Claims**



1. Currency dispensing apparatus wherein coin-dispensing means is operative to dispense coins in preset numbers from a bulk supply, and bill-dispensing means is operative to dispense bills of predetermined denomination and preset number from a supply source, said dispensing means being operative in dispensing cycles initiated by a dispensing signal and terminated responsive to counting switch means governed by settable value determining switch means operative to determine the number of coins or bills to be dispensed in a given cycle responsive to such signal, characterized in that the value-determining switch means includes settable value contactor means selectively positionable in a field of value contacts wherein coin contacts in one range when engaged by said contactor means enable said coin dispensing means to dispense coins in increasing numbers up to a predetermined arbitrary limit, and bill contacts in another range enable said bill-dispensing means to effect dispensation of bills of predetermined denomination and number dependently upon the positioning of said value contactor in engagement with value contacts in one or the other of said ranges.

4,190,067

METHOD AND APPARATUS FOR INSERTION OF WEFT THREADS IN JET WEAVING MACHINES

Vladimir Kuda, Brno; Vladimir Vasicek, Moravsky Krumlov, and Borivoj Suchanek, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 726,575, Sep. 27, 1976, abandoned. This application Aug. 30, 1977, Ser. No. 829,153
Claims priority, application Czechoslovakia, Sep. 27, 1975, 6543-75

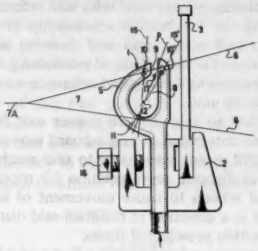
Int. Cl.² D03D 47/30
U.S. Cl. 139—435 **6 Claims**

1. In a jet loom having a nozzle adapted to direct a stream of a fluid pressure medium through a horizontally disposed weft inserting comb which is cyclically moved by a slay into the shed formed by the warp threads thereby picking a weft thread therethrough, the improvement comprising,

a comb made up of a plurality of juxtaposed comb members operatively mounted on the slay, each comb member having a pair of shank portions, the comb members each defining a weft inserting opening and the free ends of said shank portions define an unthreading channel having an inlet opening and communicating the weft inserting opening with the exterior of the comb;

the weft inserting openings through the comb members defining a horizontal picking path for the weft threads,

at least one of said plurality of comb members having at least one secondary carrying fluid conduit means having an outlet adjacent to one of the free ends of the shank portions; the axis extending through the weft inserting openings of the plurality of comb members and an imaginary line passing through the midpoints of the inlet openings of the unthreading channels of the comb members define a first plane, a rectangular projection of the axis of said secondary carrying fluid conduit outlet on said first plane forming with the axis extending through the weft inserting



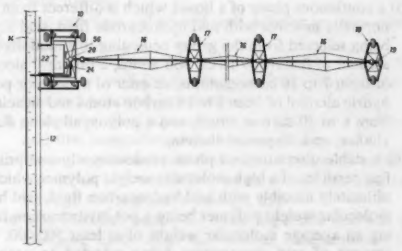
openings an angle ranging from 5°–30°, said secondary carrying fluid conduit having an outlet adjacent to each free end of the pair of shank portions, the axes of said pair of outlets mutually intersecting each other at a point located below the weft thread being inserted and below a second plane, relative to the unthreading channel, said second plane being parallel to said axis extending through the weft inserting openings and passes through the central axes of said pair of outlets.

4,190,068

SELF-CORRECTING LINEARLY MOVABLE IRRIGATION SYSTEM

Glenn A. Beusch, Post Falls, Id.; Harold L. Thompson, Spokane, Wash.; Herbert E. Lindner, Spokane, Wash., and Geoffrey G. Jones, Spokane, Wash., assignors to Gifford-Hill & Company, Inc., Tulsa, Okla.

Filed Sep. 23, 1977, Ser. No. 835,877
Int. Cl.² B05B 3/18
U.S. Cl. 137—1 **24 Claims**



17. An irrigation system for irrigating large land areas and being movable in a substantially linear manner across the land area, said irrigation system comprising:

an elongated reference means establishing a travel path across said land area;

an inboard motorized steerable mover unit adjacent said elongated reference means and defining a reference pivot point;

an outboard motorized mover unit displaced from said inboard steerable mover unit;

a plurality of irrigation pipe spans interconnecting said outboard mover unit with said inboard mover unit and rotating about said pivot point;

sensor means mounted on said inboard mover unit and having movement relative to said inboard mover unit to seek distance relating engagement with said reference means;

means sensing the mechanical relationship of said sensor relative to said mover unit and deriving an electrical representation of said mechanical relationship and thus the distance between said elongated reference means and said inboard mover unit;

wheels attached to said inboard mover unit for effecting steering and movement of said inboard mover unit;

steering control means responsive to said mechanical relationship and distance representation for rotating at least one of said wheels to cause movement of said inboard mover unit in a direction to maintain said distance representation within preselected limits;

angle indicator means for deriving a first variable electrical signal functionally related to the angular position of said outboard mover unit about said reference pivot point and relative to said inboard mover unit;

tension and compression means for deriving a second variable electrical signal functionally related to compression and tension forces acting along said plurality of irrigation pipe spans;

means for proportionately energizing said inboard and outboard mover units in response to the compression and tension signals to induce correcting movement of at least one of said outboard mover units to maintain said second electrical signal within preselected values; and

means for thereafter proportionately energizing said inboard and outboard mover units in response to said angular position signal to induce correcting movement of said inboard and outboard mover units to return said first electrical signal within predetermined values.

4,190,069

PROCESS FOR TRANSMITTING A HYDROCARBON FLUID THROUGH A PIPELINE

Karl W. Krantz, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 6, 1975, Ser. No. 584,417
Int. Cl.[2] F17D *1/17*; B01F *3/20*
U.S. Cl. 137—13 **6 Claims**

1. A process for transmitting a hydrocarbon fluid through a pipeline at a reduced fluid flow friction loss, which comprises:

A. intermixing with said fluid a composition comprising:

(i) a continuous phase of a liquid which is different from but normally miscible with said hydrocarbon fluid, said liquid being selected from the group consisting of a monohydric alcohol of from 1 to 16 carbon atoms; a dihydric alcohol of from 7 to 16 carbon atoms, an ester of a mono or polyhydric alcohol of from 1 to 16 carbon atoms and an acid of from 6 to 30 carbon atoms; and a polyoxyalkylene dialkylether; and, dispersed therein,

(ii) a stable discontinuous phase predominantly comprising fine particles of a high molecular weight polymer which is ultimately miscible with said hydrocarbon fluid, said high molecular weight polymer being a polyhydrocarbon having an average molecular weight of at least 500,000, the amount of said composition being selected to provide from 10 ppm to 1500 ppm of high molecular weight polymer based on said hydrocarbon fluid; and

B. transmitting the resulting mixture through a pipeline at a velocity sufficient to establish turbulent flow conditions.

5. A process for transmitting a hydrocarbon fluid through a pipeline at a reduced fluid flow friction loss, which comprises:

A. intermixing with said fluid a composition comprising:

(i) a continuous phase of a liquid which is different from, but miscible with, said hydrocarbon fluid, said liquid being a hydrocarbon oil of average molecular weight of less than about 2,000, and, dispersed therein,

(ii) a stable discontinuous phase predominantly comprising fine particles of a polydiorganosiloxane having an average molecular weight of at least 500,000, the amount of composition being selected to provide from 10 ppm to 1500 ppm of said polydiorganosiloxane based on said hydrocarbon fluid; and

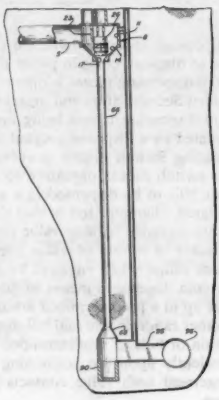
B. transmitting the resulting mixture through a pipeline at a velocity sufficient to establish turbulent flow conditions.

4,190,070

METHOD AND APPARATUS FOR CONTROLLING FLOW OF LIQUID IN GRAVITY FLOW CONDUITS

William J. Bauer, 422 S. Park Rd., LaGrange, Ill. 60525

Filed Dec. 5, 1977, Ser. No. 857,400
Int. Cl.[2] F17D *3/00*; F16K *31/22*
U.S. Cl. 137—15 **28 Claims**



1. A process for conducting liquid from a first elevation to a lower elevation through a closed gravity flow conduit comprising:

flowing the liquid from a reservoir at the first elevation past a valve assembly in said reservoir, and into and downward in a closed conduit by gravity, producing by such downward flow in said conduit, at least a partial vacuum subjacent said reservoir;

adjusting said valve assembly in response to the level of liquid in said reservoir to control the flow of liquid from said reservoir into said conduit and to maintain a pool of liquid in said reservoir, thereby precluding entry of air into the upper portion of said conduit; and

applying a continuously variable, upward force on said valve assembly to compensate the downward force thereon due to the vacuum therebeneath in said conduit, said upward force being applied automatically in response to the vacuum in said conduit subjacent said reservoir.

4,190,071

BACKFLOW PREVENTION DEVICES

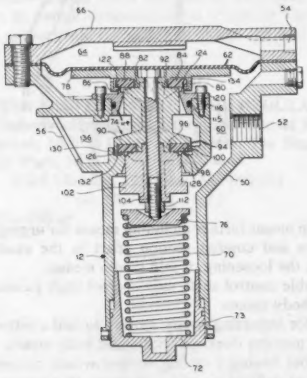
Robert H. Dean, Evanston, and Oliver Q. Dyer, Hoffman Estates, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,785
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—115 **16 Claims**

1. A backflow prevention device comprising first and second

shut-off valves, first and second spring operated check valves and a differential pressure relief valve, said first shut-off valve being connected on its upstream end to an inlet pipe and on its downstream end to said first check valve, said first check valve being connected on its downstream end to said second check valve, said second check valve being connected on its downstream end to said second shut-off valve and said second shut-off valve being connected on its downstream end to an outlet pipe, said relief valve being communicatingly interconnected between the upstream end of said first check valve and said downstream end of said first check valve to provide pressure relief on the downstream end of said first check valve when a backflow condition occurs in said device, said differential pressure relief valve comprising a valve body having an inlet communicatingly connected to said downstream end of said first check valve, an outlet port and first and second valve seat areas, a diaphragm mounted in said body and a moveable valve assembly also mounted internally of said body for movement in an axial direction thereof and in position to be operatively engaged by said diaphragm, said moveable valve assembly including:

(a) a retaining member having one surface operatively engageable with said diaphragm and having concentric first radially inner and first radially outer annular collars on its opposed surface with a first annular channel being formed between said first and second collars;



(b) a first sealing ring positioned in said first channel, said first sealing ring having a first portion and a movable portion;

(c) a first guide member having one surface abutting said first portion of said first sealing ring for retaining said ring in said first channel and having concentric second radially inner and second radially outer annular collars on its opposed surface with a second annular channel being formed between said inner and outer collars;

(d) a second sealing ring positioned in said second channel;

(e) a second guide member having a surface abutting said second sealing ring for retaining said ring in said second channel; and

(f) means for fastening the assembly together for cooperative piston motion including a central shaft engagingly fitted through central apertures in said retaining member and said first and second guide member;

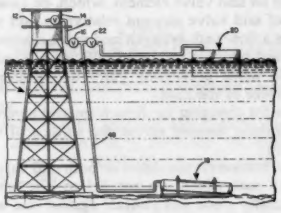
said valve body further including first and second annular seat flanges positioned in said first and second valve seat areas, respectively, for engagement with and disengagement from said first and second sealing rings to control fluid flow from said inlet port to said outlet port through said first and second valve seat areas, said moveable assembly being biased by a spring in said valve body to a normally open position wherein said first sealing ring is axially spaced from said first valve seat flange and said second sealing ring is axially spaced from said second valve seat flange, means for introducing differential pressure from said upstream and downstream ends of said first check valve into said valve body on opposing sides of said diaphragm whereby said diaphragm causes said moveable assembly to move into a closed position when said differential pressure is above a first predetermined level wherein said first valve seat flange sealingly abuts said first sealing ring and said second valve seat flange sealingly abuts said second sealing ring, and whereby said diaphragm causes said movable assembly to move into an opened position when said pressure differential is below a second predetermined level, said second valve seat area opening prior to said first valve seat area opening under certain pressure conditions, a projecting annulus included in said valve body, said projecting annulus circumferentially surrounding the outer periphery of said second radially outer collar of said first guide member in close concentric proximity thereto whereby a lift chamber is formed in the second valve seat area which provides an added force on the moveable assembly to cause accelerated opening of the valve to its fully open condition once it has partially opened.

4,190,072

UNDERWATER STORAGE ASSEMBLY

Ramon J. Fernandez, and John S. Kahl, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 718,981, Aug. 30, 1976, Pat. No. 4,141,377.
This application Oct. 12, 1978, Ser. No. 950,734
Int. Cl.[2] B65G *5/00*
U.S. Cl. 137—236 S **3 Claims**



1. An underwater storage assembly comprising

at least one cylindrical storage tank,

a skid assembly for maintaining each tank in position so that a first end of the tank is positioned higher than a second end of the tank,

said skid including pile receiving means for engagement with piles for securing the skid assembly in place at the bottom of the sea,

each tank having

at least one rigid cylindrical wall defining an inner chamber,

a flexible membrane secured to the inside of said one cylindrical wall for dividing the inner chamber into a first and a second compartment,

a passage for allowing water to pass freely into and from said first compartment from the environment,

a filtering apparatus associated with each tank for preventing debris and sea organisms from entering the tank through the respective passage, and

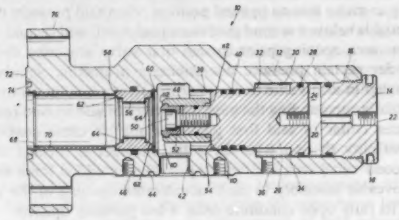
at said first end, means for receiving fluids into and discharging fluids from said second compartment, said second compartment being capable of storing said fluids and said second compartment being fluid-tight, each receiving and discharging means including a feeder pipe extending substantially the entire length of the second compartment parallel to the axis of the tank and said feeder pipe being perforated at a plurality of locations along the portion of its length within the tank.

4,190,073

CHOKE FOR CONTROLLING THE FLOW OF DRILLING MUD

Jack R. Claycomb, 8103 Gnow - #101, Houston, Tex. 77040

Filed Sep. 27, 1976, Ser. No. 727,031
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—238 **9 Claims**



1. A choke for controlling the rate of flow of mud comprising:

a hollow housing;

a movable valve element in said housing;

an encircling valve seat in said housing;

contacting surfaces on said valve element and valve seat which include tapered throttling surfaces which, on separation, define a controllable throttling passage and which contact one another on closure wherein said throttling surfaces include:

(a) a tapered surface on said valve seat cooperative with a surface on said valve element, which, on closing movement of said valve element relative to said valve seat, defines a flow path between said valve element and said valve seat which is narrowed sufficiently to permit flow of mud while preventing entry of particles above a certain size in the mud;

(b) means for directing the flow from said tapered surface in a flushing manner across the surface of said valve element;

downstream transverse shoulders on both said valve element and valve seat which are parallel to one another and which facially close and contact against one another to close the flow through said housing, said shoulders being sheltered from fluid flow through said tapered surfaces by their respective locations on said valve element and valve seat, said shoulders being relatively spaced on said valve element and valve seat to close and contact after said tapered surfaces move to their narrowest spacing therebetween and wherein said tapered surfaces are concentric of one another and wherein one of said tapered surfaces connects immediately to said transverse shoulder.

4,190,074

PRESSURE EQUALIZATION VALVE AND TECHNIQUE FOR SHAFT FURNACE

Pierre H. Mailliet, Howald, and Michel Kirchen, Luxembourg, both of Luxembourg, assignors to Paul Wurth, S.A., Luxembourg

Filed Jul. 8, 1977, Ser. No. 814,105
Claims priority, application Luxembourg, Jul. 13, 1976, 75372
Int. Cl.[2] F16K *43/00, 31/12*
U.S. Cl. 137—315 **12 Claims**

1. A pressure equalization valve comprising:

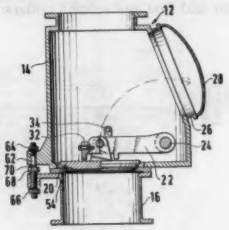
valve body means, said body means being adapted for connection between a pair of spacially displaced conduits, said body means defining a fluid flow path having an axis, said valve body means having end portions circumscribing said flow path, said body means being provided with a lateral opening at one side thereof;

removable cover means for said body means lateral opening;

a conduit section, said conduit section having an axis aligned with the fluid flow path axis of said valve body means, said conduit section having end portions circumscribing said flow path, said conduit section being displaced from said body means along said aligned axes;

valve seat means, said valve seat means being transversely movable with respect to said aligned axes and having a generally annular shape, said valve seat means being positioned between said body means and said conduit section and in contact with facing end portions thereof when in the installed state, said seat means defining a valve seat having an aperture axially aligned with said fluid flow path;

means for clamping said seat means between said body means and said conduit section facing end portions, said clamping means interconnecting said valve body means and said conduit section, said seat means being removable from said valve in a direction transverse to said fluid flow path axis upon loosening of said clamp means without interruption of the connection between and the axial alignment of said body means and said conduit section, said clamp means when in the tightened condition causing establishment of a hermetic seal between each of said body means and said conduit section and said seat means, said



clamp means further including means for urging said body means and conduit section apart in the axial direction upon the loosening of said clamp means;

a rotatable control shaft, said control shaft passing through said body means;

means for imparting rotary motion to said control shaft;

a valve member disposed within said body means, said valve member having a sealing surface which cooperates with the seat defined by said seat means to perform a valving function;

pivot arm means, said pivot arm means being connected adjacent a first end thereof to said rotatable control shaft; and

means coupling said valve member to said pivot arm means adjacent the second end thereof whereby rotation of the control shaft will result in said valve member moving between a closed position wherein said sealing surface is in contact with said valve seat and an open position wherein said valve member is disposed adjacent to said body means lateral opening, said coupling means permitting articulation of said valve member with respect to the second end of said pivot arm means.

4,190,075

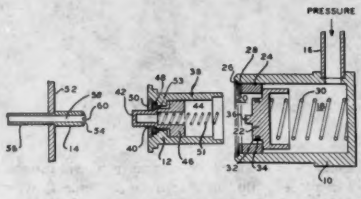
DOUBLE VALVE CONSTRUCTION

John P. Kayser, Madison, Wis., assignor to Airco, Inc., Montvale, N.J.

Filed Sep. 26, 1977, Ser. No. 836,864
Int. Cl.[2] F16K *15/18*
U.S. Cl. 137—329.1 **5 Claims**

1. A double valve construction comprising a secondary housing including an inlet adapted to be connected to a source of gas or vacuum, said secondary housing having a secondary valve including means biasing said secondary valve toward its closed position, said secondary valve having a movable valve

element and a valve seat on said secondary housing, a primary housing having one end thereof adapted to be operably inserted into said secondary housing to axially move said secondary valve against said biasing means, said one end of said primary housing including seal means preventing said secondary valve from opening by the insertion of said primary housing into said secondary housing, a dust cap valve means including bias means biasing said dust cap valve means towards its closed



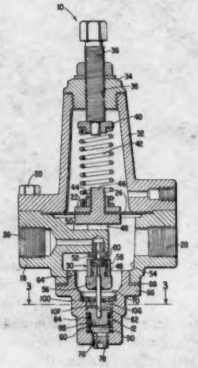
position, said dust cap valve means normally closing the outlet on the other end of said primary housing, a primary valve formed between said one end of said primary housing and said secondary valve when said primary housing is interfitted into said secondary housing, said dust cap valve means adapted to receive an adapter means to first open said dust cap valve means a predetermined linear distance to then open said primary valve to permit communication of gas or vacuum between said primary and secondary housings and said outlet.

4,190,076

DAMPING VALVE FOR PRESSURE REGULATOR

Albert R. Cameron, Huntingdon Beach, and Donald R. Gneiding, Fullerton, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Mar. 24, 1978, Ser. No. 890,003
Int. Cl.² F16K *31/12*
U.S. Cl. 137—505.45 **2 Claims**



1. A pressure regulator operative responsive to inlet pressure and outlet pressure comprising:

a. a housing having an inlet, an outlet, a transverse wall separating the inlet and the outlet, and an outlet chamber formed on the outlet side of the transverse wall,

b. a valve diaphragm disposed on the outlet side of the transverse wall and having one side thereof in communication with the outlet chamber,

c. an inlet orifice formed in the transverse wall to communicate the inlet with the outlet,

d. a valve connected to be actuated by the valve diaphragm and to be shifted toward or away from the inlet orifice responsive to the pressure in the outlet chamber,

e. a damping chamber formed in the housing below the valve, said damping chamber having a circular cross section,

f. hydraulic liquid filling the damping chamber,

g. a flexible seal, having a central aperture, to separate the outlet chamber from the damping chamber,

h. a piston, having a head, slidingly received in the damping chamber, said head of the piston being circular and of substantially equal diameter to the cross section of the damping chamber, a lower portion being formed on the piston below the head and of reduced diameter, and a spring is received about the lower portion and to engage the bottom of the chamber to normally urge the piston upwardly in the direction of the seal.

i. a plurality of flats formed on the head in circumferentially spaced relationship to each other to provide passages for the hydraulic liquid to pass from one side of the piston to the other whenever the piston is moved,

j. a connecting rod sealingly passing through the flexible seal, and having one end located in the valve and the other end affixed to the piston, and

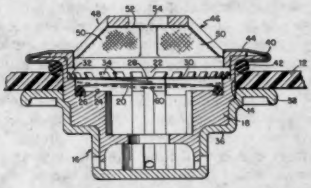
k. said housing having a portion opposite the inlet orifice which is counterbored to define a large upper bore and a small lower bore, with the lower bore forming said damping chamber, the flexible seal being circular and fitted within the upper bore, and a retaining ring clamps the flexible seal to the bottom of the upper bore to enclose the top of the damping chamber.

4,190,077

MICROWAVE APPLIANCE VALVE

Robert F. Bowen, Burlington, and Philip A. Knight, Jr., Concord, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 813,034, Jul. 5, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,352
Int. Cl.² G05D *23/02*; A47J *31/00*
U.S. Cl. 137—550 **6 Claims**

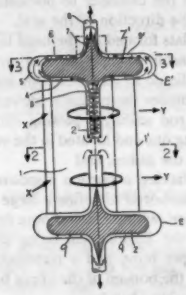


1. A valve assembly for use in a microwave environment comprising a valve housing having a circumferential portion shaped to fit within an opening in the bottom of a microwave-transparent liquid-containing reservoir and having a vertical passage therethrough with an inlet portion at its upper end and an outlet portion at its lower end whereby liquid in the reservoir may flow downwardly through the passage, a bimetal valve member positioned in said passage and movable into and out of normally closed relation to the passage to control the flow of liquid downwardly therethrough, said inlet portion of the passage being open above the valve member to permit microwaves to contact liquid therein, and a filter mounted on the housing over said inlet portion of the passage, said filter being a screen of microwave-transparent material having a central portion overlying the valve member and bowed upwardly away from the valve member whereby air bubbles in the liquid within the passage between the valve member and filter may rise away from the vicinity of the valve member.

4,190,078
APPARATUS FOR CONVERTING OF SPIN FLOW ENERGY INTO PRESSURE ENERGY

Ernst-August Bielefeldt, Hollenstedt, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 27, 1977, Ser. No. 801,382
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625422
Int. Cl.² F15D 1/04
U.S. Cl. 137—561 R 11 Claims



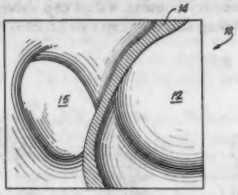
1. An apparatus for recovering spin flow energy wherein a spin flow is converted into a parallel flow, comprising conduit means having inlet port means for said spin flow and outlet port means for said parallel flow, chamber means located in said conduit means intermediate said inlet port means and said outlet port means and having a configuration of rotational symmetry, a central member also having a shape of rotational symmetry operatively supported in said chamber means, said central member and said chamber means being dimensioned and shaped relative to each other so as to include the following flow passage components therebetween, a first flow passage component providing a smooth transition from an axial flow direction into a substantially radially outward flow direction, a second flow passage component operatively connected to said first flow passage component and constituting a plate diffuser, a third flow passage component operatively connected to said second flow passage component and constituting an annular deflection zone, a fourth flow passage component operatively connected to said third flow passage component and forming a guide zone to cause a substantially inward flow direction, and a fifth flow passage component operatively connected to said fourth flow passage component and constituting a smooth transition from said inward flow direction into an axial flow direction toward said outlet port means whereby said flow passage components are arranged in the recited sequence as viewed in the flow direction from said inlet port means to said outlet port means.

4,190,079
HIGH SURFACE AREA PERMEABLE MATERIAL

Eugene W. White; William M. Hanusiak, both of State College, Pa., and Rodney A. White, Torrance, Calif., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 713,258, Aug. 10, 1976, Pat. No. 4,075,092. This application Dec. 9, 1977, Ser. No. 859,135
Int. Cl.² B01D 3/00
U.S. Cl. 137—561 R 2 Claims

1. Apparatus comprising a chamber, a tubular integral, three-dimensional structure providing two separate interpenetrating, three-dimensional domains or channels, each of said domains or channels being a closed system of connected porosity or permeability with multiple interconnections only with respect to its respective domain or channel, each of said domains or channels being interpenetrating within said structure, said structure being fluid-tightly fixed at both ends within said chamber such that a closed annular space is provided between the exterior of said tubular structure positioned within said chamber and the interior of said chamber, first fluid inlet and outlet means associated with said chamber for the supply of

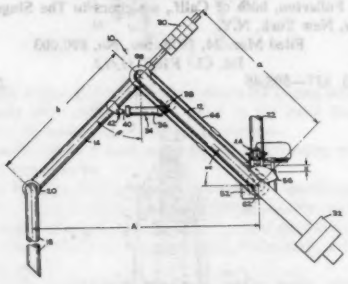


fluid to one of said channels or flowpaths in said tubular structure and to receive fluid exiting from said one flowpath and second fluid inlet and outlet means associated with said chamber for the supply of fluid to the other one of said channels or flowpaths in said tubular structure and to receive fluid exiting from said other flowpath.

4,190,080
ARTICULATED LOADING ARM CONTROL SYSTEM

Eugene R. Le Devehat, Saligny, France, assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 17, 1978, Ser. No. 888,608
Claims priority, application France, Mar. 17, 1977, 77 08070
Int. Cl.² B65B 3/04; F15B 9/00
U.S. Cl. 137—615 14 Claims



1. An articulated loading arm for the transfer of fluid from a first site to a second site, comprising:

an inboard arm section pivotally connected to a supply conduit for receiving the fluid to be transferred from the first site;

an outboard arm section pivotally connected to said inboard arm section to receive fluid therefrom;

a drop pipe pivotally connected to the outboard arm section to deliver said fluid to the second site;

a hydraulic jack;

means for connecting said hydraulic jack between said outboard arm section and said inboard arm section to pivotally move said outboard arm section relative to said inboard arm section;

means for sensing the attitude of said inboard arm section, including control means and means for coupling said control means to said inboard arm section to facilitate response of said control means to said attitude of said inboard arm section;

means for sensing the attitude of said outboard arm section, including means for coupling said control means to said outboard arm section to facilitate response of said control means to said attitude of said outward arm section;

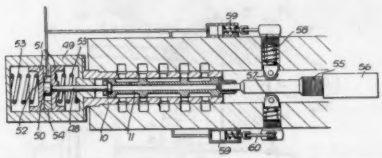
said control means providing hydraulic pressure to said hydraulic jack in response to a change in the attitude of said inboard arm section, said outboard arm section, or both of said arm sections to maintain said drop pipe in a predetermined azimuthal position relative to said supply conduit.

4,190,081

ELECTRO-HYDRAULIC SYSTEMS

Ernest F. Coles, Welwyn Garden City, England, assignor to Hawker Siddeley Dynamics Engineering, Ltd., Hatfield, England

Filed Oct. 12, 1977, Ser. No. 841,442
Claims priority, application United Kingdom, Oct. 14, 1976, 42695/76
Int. Cl.² F15B *13/044*
U.S. Cl. 137—624.27 **3 Claims**



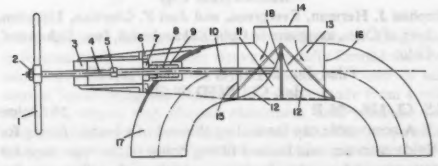
1. An electro-hydraulic servo valve assembly for regulating the amount or pressure of hydraulic fluid supplied to a hydraulically-operated machine system, comprising a ported valve sleeve, a progressively rectilinearly movable valve spool controlling ports in said valve sleeve, a rotary motive power unit, coupling means including a leadscrew and nut mechanism coupling the drive of the motive power unit to the valve spool, a valve spool position transducer supplying a feedback signal representative of the instantaneous position of the valve spool, electrical control means controlling the energization of the motive power unit in accordance with input command signals and the feedback signal, means for centering the valve spool in the absence of hydraulic pressure, and hydraulically-operated means locking the leadscrew against rotation when hydraulic pressure is present and unlocking to allow the leadscrew to rotate in the absence of hydraulic pressure to permit the valve spool to be centered.

4,190,082

ADJUSTABLE DISTRIBUTION VALVE

Mariano Hernández Crespo, Madrid, Spain, assignor to Empresa Nacional de Ingenieria y Tecnologia, S.A., Madrid, Spain

Filed May 16, 1978, Ser. No. 906,373
Claims priority, application Spain, May 20, 1977, 228.623[U]
Int. Cl.² F16K *11/07*
U.S. Cl. 137—625.17 **4 Claims**



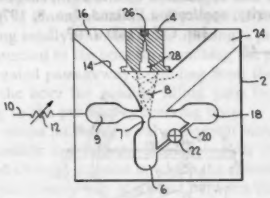
1. An adjustable distribution valve having an inlet opening and two outlet openings and comprising a generally T-shaped body defining first, second and third branches, the first and second branches being axially aligned, being provided respectively by the horizontal limbs of the T, and defining the two outlet openings respectively and the third branch being provided by the vertical stem of the T and defining the inlet opening, and the valve further comprising a plug element fitted in the passage defined by the axially-aligned first and second branches and movable therewithin, and an actuating rod secured to the plug element and extending therefrom axially within the first branch and through the outlet opening defined thereby, said plug element being bounded by a cylindrical surface of diameter equal to the diameter of said passage, and two opposed concave surfaces which intersect said cylindrical surface at a point substantially halfway along the plug element and at opposite ends of the plug element at positions which are diametrically opposite said point with respect to said cylindrical surface, the plug being movable longitudinally within said passage by means of said actuating rod between a first position, in which said point confronts the inlet opening and the plug element distributes fluid received by way of said inlet opening to both outlet openings, a second position, in which the plug element blocks said first branch and directs fluid received by way of said inlet opening to the outlet opening defined by said second branch, and a third position, in which the plug element blocks said second branch and directs fluid received by way of said inlet opening to the outlet opening defined by said first branch.

4,190,083

FLUIDIC LOGICAL PYROTECHNIC INITIATOR

Tadeusz M. Drzewiecki, Silver Spring, Md., and John M. Goto, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 7, 1977, Ser. No. 831,320
Int. Cl.² F15C *1/08*
U.S. Cl. 137—838 **8 Claims**



1. A fluidic relay device comprising:

output means for generating an output when impacted by a supersonic jet; and

a monostable fluid amplifier comprising a power nozzle for emitting a supersonic fluid jet, a first vent means having a flow attachment surface to which said supersonic jet attaches when said amplifier is in its stable mode, a control channel for emitting a control fluid to direct said supersonic jet to impact said output means, and a second vent means for venting said fluid jet away from said output means when the pressure of said control fluid exceeds a desired level.

4,190,084

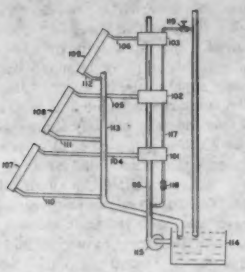
FLOW CONTROL MEANS

Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,548
Int. Cl.² G05D *7/01*
U.S. Cl. 137—883 **1 Claim**

1. A fluid manifolding system comprising a main flow line, a plurality of branch flow lines, a flow control valve means connected to each branch point, and a control line operably connected to said control valve means, wherein said control valve means comprises in sequence a fixed constriction in the branch flow path and a flexible diaphragm responsive to the pressure in said control line, positioned for throttling the flow

in said branch flow path, and means for controlling the control line pressure in relation to the main flow line pressure,



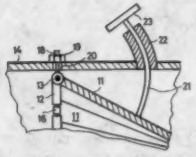
whereby the flow in each of said branch flow lines is maintained at a desired flow rate.

4,190,085

GAS FLOW REGULATING AND MEASURING APPARATUS

Juhani Hasa, and Arvi Tolmunen, both of Kausala, Finland, assignors to Halton Oy, Finland

Continuation-in-part of Ser. No. 766,795, Feb. 8, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,792
Claims priority, application Finland, Jun. 8, 1976, 761622
Int. Cl.² F16D *1/02*
U.S. Cl. 138—45 **14 Claims**



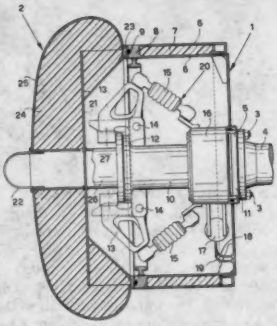
1. Apparatus for controlling the flow of a gas comprising: a collar member having a longitudinal axis and a pair of opposed end regions, said collar member being adapted to be sealingly connected to at least one duct member through which a gas flow stream passes so that said gas stream can flow through said collar member; means provided within said collar member between said end regions thereof for mounting a plurality of throttling blades therein; and a plurality of throttling blades, each of said throttling blades being defined by a substantially rectangular plate member having a pair of opposed long edge regions defining first and second side edge regions and a pair of opposed short edge regions, defining upstream and downstream edge regions, said plate member having a longitudinally warped transversely curved configuration, said throttling blades each being pivotally hinged to said mounting means so that said first side edge region of each throttling blade overlaps and resiliently engages the second side edge region of an adjacent throttling blade with a positive bearing force over the substantial length of said side edge regions resulting in a fluidly sealed engagement between adjacent blades, said blades defining the side surface of a truncated cone which is air tight due to said sealing engagement between the first and second side edge regions of adjacent throttling blades and whose axis coincides with said collar member axis, said blade upstream end regions defining the base of said truncated cone and said downstream end regions defining the apex of said truncated cone, and said mounting means supporting said blades for pivotal movement for adjusting the inclination of said blades and thus the size of said apex to control the size of an aperture defined by said downstream end regions of said blades through which a gas in said collar member is adapted to flow, so that by situating said blades at a predetermined inclination in said collar member the flow of air therethrough can then be regulated.

4,190,086

CONNECTOR DEVICE FOR THE QUICK COUPLING OF FLOATING HOSES

Giorgio Bormioli, Via Galileo Galilei 21, Padova, Italy

Filed Sep. 5, 1978, Ser. No. 939,345
Int. Cl.² F16L *55/00*
U.S. Cl. 138—89 **2 Claims**



1. A connector device for quickly coupling one end of a buoyant, flexible hose to one end of a pipe, comprising

a pair of buoyant housings having cooperating ends releasably attachable together to form a single floating body with a hydraulic seal between said cooperating ends,

one of said housings containing a first section of piping having one end secured to said one end of said hose,

the other of said housings having thereon a further section of piping closed at one end and releasably and sealingly attachable at its opposite end to the opposite end of said first section of piping to function as a cover therefor, and

means in said one housing and operable from the exterior thereof for releasably securing said opposite end of said first section of piping selectively to said opposite end of said further section of piping, or to said pipe when said housings are detached from each other.

4,190,087

BREATHER CAP

Stephen J. Herman, Evergreen, and Joel F. Giurtino, Littleton, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 26, 1978, Ser. No. 918,725
Int. Cl.² B65D *59/06*
U.S. Cl. 138—96 R **16 Claims**

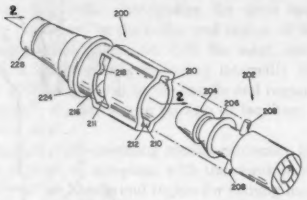
1. A removable cap for sealing the end of a barbed fitting for a fluid reservoir, said barbed fitting being of the type used for connecting tubing and having a mouth with a first exterior surface in the shape of a circular edge surrounding said mouth, a second exterior surface in the shape of a tapered surface of revolution surrounding said mouth, said tapered surface being for stretching said tubing radially during installation, and a raised portion axially behind said tapered surface, said cap comprising:

a tubular body with one open end and one closed end,

said tubular body adapted to slip loosely over the exterior of said tubular fitting,

a first interior surface of revolution in the interior of said tubular body said interior surface being tapered to bear against one of said exterior surfaces on said barbed fitting and thereby provide a fluid-tight annular seal between said interior and exterior surfaces,

first retaining means for preventing said cap from moving axially away from a venting position in which said cap fits loosely over said barbed fitting and said interior and exterior surfaces do not engage, whereby fluids can be vented from said reservoir,



helical means in the wall of said tubular body for cooperating with said raised portion of said barbed fitting, for moving said cap into a sealing position with said fitting wherein said interior and exterior surfaces are tightly engaged,

second retaining means for preventing said cap from rotating relative to said fitting while in said sealing position to thereby maintain tight engagement between said interior and exterior surfaces,

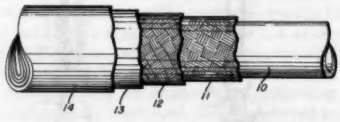
said first and second retaining means each being releasable and said helical means being reversible, for removing said cap from said fitting and for moving said cap back and forth between said sealing and venting positions.

4,190,088

CHAFE OR FIRE SLEEVE FOR HOSE

James M. Lalikos, Springfield; Chester T. Gazda, Chicopee, and Lawrence O'Melia, Easthampton, all of Mass., assignors to Titeflex Corporation, Springfield, Mass.

Filed Mar. 8, 1978, Ser. No. 884,612
Int. Cl.[2] F16L *11/10*
U.S. Cl. 138—126 **16 Claims**



1. A chafe or fire sleeve for an aircraft fuel hose comprising an internal tube with an outer sleeve integrally formed thereon, said sleeve having a pair of coaxial layers, an outer of said coaxial layers being the chafe or fire sleeve made from a mixture of urethane and silicone elastomers, said urethane and silicone in said outer layer being mixed, with their proportions being in the range of 80% to 20% urethane and 20% to 80% silicone, respectively, and an inner of said coaxial layers being silicone.

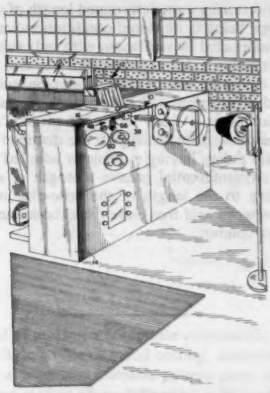
12. A hose comprising an inner tube structure covered by a chafe or fire sleeve coaxially formed thereon, said chafe or fire sleeve being a coaxial member comprising an outer layer of urethane and silicone elastomers mixed in the range of, respectively, 80%/20% to 20%/80%, and the inner member being a layer of silicone formed between said inner tube and said outer layer.

4,190,089

PROJECTILE LAUNCHING APPARATUS

Petras Cyvas, Worcester, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,642
Int. Cl.[2] D03D *47/36*
U.S. Cl. 139—437 **9 Claims**



1. In a pneumatic loom in which filling picks are inserted from an outside supply source by a pneumatically launched projectile, projectile launching and receiving apparatus comprising:

(a) a housing having an inner opening at one end, an outer opening at the opposite end, a projectile receiving bore extending axially from the inner opening, a pressure chamber connected to the bore for launching the projectile and an elongated passageway extending from the outer opening to the bore for guiding filling yarn from the outer opening to the projectile receiving bore,

(b) valve means including a valve element movable from an open position in which the element is clear of the passageway and a closed position in which the element is effective to seal the passageway at a point between the outer opening and pressure chamber, and

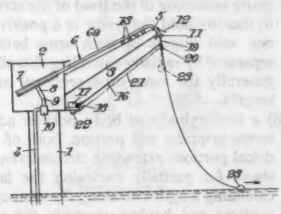
(c) control means for moving the valve element to the closed position during receiving and launching of the projectile.

4,190,090

EQUIPMENT SERVING TO CONNECT OIL-TANKERS TO MARINE TOWERS

Samuel Tuson, Mesnil-le-Roi, France, assignor to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H., France

Filed Oct. 12, 1977, Ser. No. 841,484
Claims priority, application France, Oct. 19, 1976, 76 31431
Int. Cl.[2] B63B *35/44*; B67D *5/04*
U.S. Cl. 141—387 **5 Claims**



1. Apparatus for connecting a petroleum-oil supply line mounted on a marine column to a received conduit mounted on an oil-tanker, comprising: a rotary head mounted on said column and rotatable about the axis thereof; a boom mounted

on said head and extending radially therefrom; a hose-pipe connected at its upstream end to said oil-supply line of said column; a connector member provided at the downstream end of said hose-pipe adapted to be coupled to said receiver conduit on said oil tanker; a mooring hawser connected at one end to storage means provided on said head and adapted to be connected at its other end to said oil-tanker to be loaded; and a hose-pipe storage pulley rotatably mounted on said head for receiving and storing a predetermined length of said hose-pipe, said hose-pipe being in its stored condition wound around said pulley and supported by said boom with only substantially said connector member extending from the free end of said boom, said boom including low friction hose-pipe guide means for guiding and supporting said hose-pipe, said pulley having a single circumferential hose receiving groove the width of which corresponds substantially to the diameter of said hose-pipe, and said pulley having a diameter adapted for storing in said single circumferential groove a length of said hose-pipe corresponding to the length of the hose-pipe in its working condition between said free end of said boom and the inlet of said receiver conduit.

4,190,091

SCREW, SCREWDRIVER AND SCREW-HOLDING ATTACHMENT THEREFOR

Aldo Colognori, 69 Lawton Ave., Cliffside Park, N.J. 07010, assignor to Sebastian Zuppichin, Cliffside Park and Aldo Colognori, Cliffside, both of, N.J.

Filed Sep. 26, 1978, Ser. No. 945,811

Int. Cl.[2] B25B *15/00, 23/10*

U.S. Cl. 145—52 **3 Claims**

1. A screw-holding screwdriver, comprising:

(a) an elongated driver shank having a longitudinal axis, a handle end region, and an opposite blade end region,

(b) a driver blade of one-piece with the blade end region of the shank;

(c) means for holding a screw to be turned by the driver blade, said holding means including

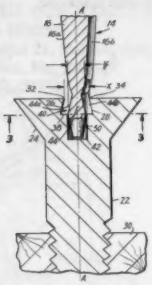
(1) a pair of movable elongated resilient arms at opposite sides of the driver shank, said arms being separated by two slots which extend lengthwise along the arms, each arm including

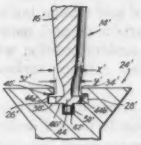
(A) a screw-gripping end portion having a plurality of curved fingers which extend in smooth, continuous arcuate manner, both longitudinally away from the handle end region and radially inwardly towards the longitudinal axis to thereby form a generally semi-dome-shaped configuration, said fingers of both arms terminating at tips which define a circular periphery which surrounds the stem of the screw to be turned, said fingers of both arms engaging substantially the entire underside of the head of the screw to be turned to thereby hold the screw in a positive locking manner, said fingers of both arms being successively separated by radially-extending slits all of which have generally the same cross-sectional area along their lengths,

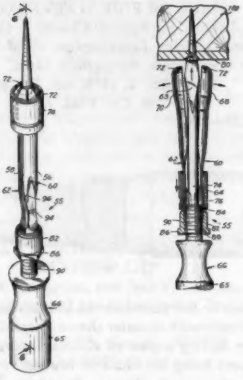
(B) a semi-cylindrical body portion adjacent to each screw-gripping end portion, both of the semi-cylindrical portions extending circumferentially about the shank for partially enclosing the latter, each slot extending lengthwise along the semi-cylindrical body portions and having generally the same cross-sectional area along the lengths of the latter,

(C) a generally flattened body portion adjacent to each semi-cylindrical body portion, both flattened body portions being located at opposite sides of the shank and having arcuate side edge regions which extend radially inwardly towards the longitudinal axis such that each slot has an enlarged cross-sectional area in the region of the flattened body portions, and

(D) a semi-cylindrical collar end portion adjacent to each flattened body portion for partially enclosing the shank, and







(2) means for moving the resilient arms between a non-gripping position in which the arms are spaced apart of each other, and a gripping position in which the screw-gripping end portions form a dome-shaped configuration and substantially enclose the screw head of the screw to be turned,

said moving means constituting a cylindrical locking sleeve slidably mounted over the resilient arms for movement lengthwise of the latter, said locking sleeve having an interior passage formed with a leading axial end, a trailing axial end and an annular cam-type projection intermediate said axial ends of the passage, said projection being an annular ridge which extends radially inwardly from the inner circumferential wall of the passage, said ridge being in sliding frictional engagement with the body and end portions of the arms; and

(d) means for finely and continuously adjusting the position of the holding means in longitudinal direction relative to the shank, said fine-adjusting means including

(1) a mounting collar surrounding the arms and being fixedly connected to the collar end region of the arms for longitudinal movement with the same, said collar having a longitudinally-extending internally threaded collar portion adjacent to the handle end region, and a polygonally-shaped flange portion to facilitate manual gripping, and

(2) a longitudinally-extending mating externally threaded shank portion of one-piece with the shank in the near vicinity of the handle end region for turning movement with the shank, said mating shank portion being in constant threaded engagement with the threaded collar portion during the entire turning movement of the driver shank for shifting the shank relative to the holding means with infinitely variable displacement.

4,190,092

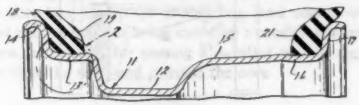
WHEEL RIM

James L. Evans, Ypsilanti, and John A. Main, Plymouth, both of Mich., assignors to Kelsey-Hayes Co., Romulus, Mich.

Continuation-in-part of Ser. No. 673,736, Apr. 5, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,048

Int. Cl.[2] B60C *5/00*; B60B *21/00*

U.S. Cl. 152—381.1 **5 Claims**



1. In an automotive wheel suitable for mounting a pneumatic tire thereon having an annular rim portion with a pair of axially spaced radially outward extending annular flanges, an annular well portion intermediate said flanges and an annular imperforate bead seat portion adjacent each flange and axially spaced from said well portion, each bead seat portion having a radially outer annular surface for seating the base of each bead portion of said pneumatic tire, the improvement comprising at least one circumferentially continuous radially outward projecting protuberance rising from each annular bead seat surface such that the cross-sectional thickness of said bead set is not diminished, each protuberance comprising a radially outward projecting side, said side having at least a portion thereof normal to the wheel axial centerline and forming a base angle with the annular bead seat surface, a descending surface extending from said radially projecting side sloped radially inward and axially toward said annular well, said descending surface terminating at the intersection of said surface and the annular bead seat surface, said descending surface permitting movement of the tire bead axially thereover away from the wheel well upon inflation of said tire whereby the tire bead portion becomes locked between said radially outward extending flanges and said radially outward projecting side of said protuberance by compression of the bead elastomer therebetween.

4,190,093

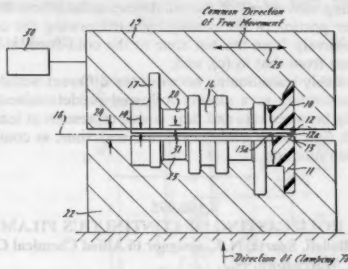
VIBRATION WELDING OF EXPANDED BEAD POLYSTYRENE

Dolores C. Kearney, Inkster, and Bruno Matz, Milford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1978, Ser. No. 957,376

Int. Cl.[2] B22C *9/04*, *7/02*

U.S. Cl. 164—34 **13 Claims**



1. A method of making a composite consumable pattern for use in the cavityless type of metal casting, comprising:

(a) forming at least two mateable pattern parts, each having at least one mating plane defined by a flat surface except for predetermined melt-down projections on said surfaces, said parts being constituted entirely of a low density expanded closed-cell polymeric material having a density of 3 lbs./ft^3 or less which upon contact with molten metal is ignited and consumed,

(b) bringing said parts together into contact with said mating surfaces parallel and juxtaposed, while urging said contact with a force of 5–10 psi,

(c) while in said forced contacting relationship, relatively vibrating said parts to promote friction at at least one of the melt-down projections and surfaces thereby promoting a friction weld upon resolidification of the melt-down material, said relative vibration being carried out for a period of time no greater than 2 seconds, with a vibration amplitude of 0.03–0.10" and a frequency of 120–240 cycles/second.

4,190,094

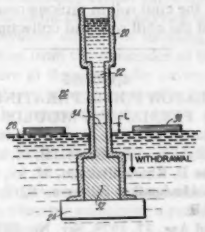
RATE CONTROLLED DIRECTIONAL SOLIDIFICATION METHOD

Anthony F. Giamei, Middletown, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 25, 1978, Ser. No. 954,386

Int. Cl.[2] B22D *27/04*, *25/00*

U.S. Cl. 164—60 **17 Claims**



1. In the withdrawal method of directional solidification of a metal casting which is characterized by differing perimeter to area ratios along its length,

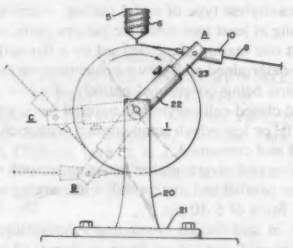
a. maintaining a hot zone at a temperature above the liquidus temperature of the metal of the casting;
b. maintaining a cold zone at a temperature below the solidus temperature of the metal of the casting;
c. withdrawing the casting progressively from the hot zone to the cold zone to effect movement of a nominal solidification interface, which is located between the liquidus isotherm and the solidus isotherm, at a rate which directionally solidifies at least a substantial portion of the casting;
d. effecting movement of the solidification interface through another portion of the casting by withdrawing the casting progressively from the hot zone to the cold zone, at a rate different from that in (c), and;
e. controllably transitioning between the different withdrawal rates according to a closely followed predetermined relationship between rate and time which represents at least one smooth function of withdrawal rate with time, as compared to a step function.

4,190,095

CHILL ROLL CASTING OF CONTINUOUS FILAMENT

John R. Bedell, Sparta, N.J., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Oct. 28, 1976, Ser. No. 736,690
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—87 4 Claims



1. The improvement in the process of making metal filament by depositing molten metal onto the peripheral surface of a rotating annular chill roll and separating the solid filament from the chill roll, which comprises:

(a) capturing the filament in its normal trajectory from the point at which the filament is separated from the chill roll by action of centrifugal force and, by means of an aspirator, applying tension to the filament in a first direction tangential to the chill roll away from the point at which the filament is separated from the chill roll by centrifugal force; and

(b) maintaining tension on the filament by means of said aspirator while changing the direction of the applied tension to a second direction tangential to the chill roll past the point at which the filament is separated fro the chill roll by centrifugal force, to thereby maintain the filament on the chill roll to prolong contract between the filament and the chill roll, and collecting the filament.

4,190,096

MANIPULATOR FOR SEPARATING COATED PERMANENT MOULDS

Anatoly D. Teplinsky, ulitsa Generala Petrova, 27, korpus 1, kv. 73; Yakov M. Ryvkis, ulitsa Garibaldi, 14, kv. 26; Rostislav L. Snezhnoi, ulitsa B. Khmelnitskogo, 36, kv. 12, and Leonid Y. Netes, ulitsa Akademika Filatova, 82/2, kv. 101, all of Odessa, U.S.S.R.

Filed Apr. 17, 1978, Ser. No. 897,539
Int. Cl.[2] B22D *29/04, 33/02*
U.S. Cl. 164—158 8 Claims

1. A manipulator for use in effecting separation of split coated permanent metal moulds having two parts formed with air injection holes and a parting plane disposed horizontally when in a position for separation, comprising,

a frame;

a hoisting mechanism operable to deliver and place said coated permanent moulds in position for separation mounted on said frames and having:

a guiding plate rigidly fixed on said frame,

a carriage mounted on said guiding plate,

supports adapted to carry said permanent mould being rigidly fixed on said carriage,

a power cylinder rigidly connected with said guiding plate and geared to said carriage for transmitting up and down linear movement to the latter;

two clamping devices mounted on said frame adapted to grip the top part of said mould when in position for separation;

one of said clamping devices being a housing rigidly fixed on said frame,

a power cylinder incorporating a case mounted in said housing for axial movement therealong,

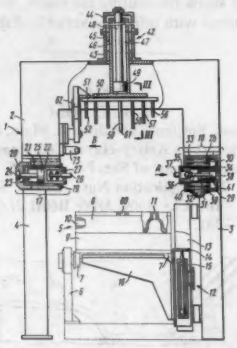
a rod fixed in said housing,

a piston rigidly fixed to said rod,

a bar mounted on the end of said case to move therewith in the course of clamping and releasing of said mould part;

the other clamping device being a housing rigidly fixed on said frame,

a power cylinder incorporating a case rigidly fixed in said housing,



a rod movably mounted with respect to said case,

a piston rigidly fixed to said rod,

a tail spindle kinematically linked with said rod and effecting translatory motion therewith,

a cross-bar fixedly attached to said tail spindle,

at least two bars rigidly fixed on said cross-bar and effecting translatory motion therewith in the course of clamping and releasing said mould part;

a turnover device mounted on said second-mentioned clamping device for handling the mould top part being defined by,

an actuator,

a gear rack mounted in the housing of said second-mentioned clamping device and geared to said actuator operable to transmit translatory motion thereto relative to said housing,

a gear wheel mounted in said housing being brought into engagement with said rack and operable to transmit rotational motion to said gear wheel, said wheel being kinematically linked through a slot connection with said tail spindle and rotating therewith;

a broaching mechanism fixed on said frame above said clamping devices, being operable to push out during separation of the finished casting from said top part of the mould into the bottom part thereof, and concurrently

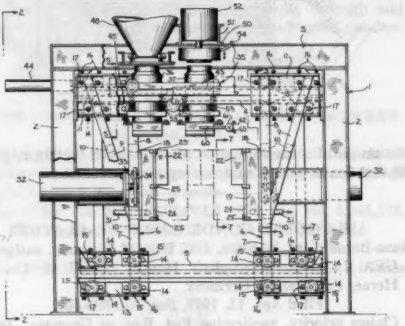
cleaning the air injection holes in said top part of the mould of the used coating.

4,190,097

APPARATUS FOR MAKING FOUNDRY CORES

John J. Allread, Hartland; Thomas A. McManamy, Reedsburg, and Bruno E. Peter, Brookfield, all of Wis., assignors to Grede Foundries Inc., Milwaukee, Wis.

Filed Nov. 23, 1977, Ser. No. 854,420
Int. Cl.[2] B22C *15/24*
U.S. Cl. 164—343 4 Claims



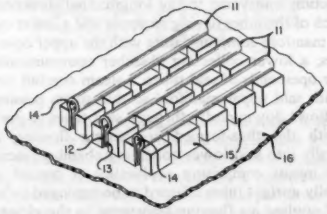
1. An apparatus for producing foundry cores, comprising a frame, a plurality of generally parallel guide rails mounted on the frame, a pair of carriages, a plurality of rollers on each carriage, said rollers mounted for movement on said guide rails, a core box section mounted on each carriage, said guide rails include a pair of upper guide rails located at the front and rear of the apparatus respectively, and a single lower guide rail disposed at the rear of the apparatus, power means connected to each carriage to move the carriages in a direction toward and away from each other, moving said carriages toward each other bringing said core box sections into mating relation to form a core box, means for introducing sand coated with an uncured resin capable of being cured by a catalyst gas into said core box, and means for passing a cayalyst gas through said sand to cure the resin and provide the core.

4,190,098

MULTIPLE COMPONENT CIRCUIT BOARD COOLING DEVICE

Alfred G. Hanlon, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 16, 1978, Ser. No. 878,501
Int. Cl.[2] H01L *23/40*
U.S. Cl. 165—1 5 Claims



1. A method of cooling a multiplicity of solid state components mounted in parallel rows upon a printed circuit board, comprising:

insertion of a heat exchange means between adjacent pairs of said parallel rows of said solid state components; and

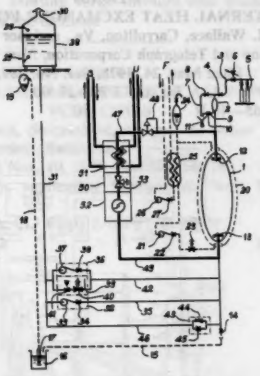
conduction of radiated heat away from said adjacent pairs of said parallel rows of said solid state components.

4,190,099

HEAT TRANSFER SYSTEM FOR THE UTILIZATION OF CAVITIES DUG IN THE SUBSOIL AS HEAT SILOS

Jacques Despois, Viroflay, and Francis Nougarede, La Celle Saint Cloud, both of France, assignors to Commissariat a l'Energie Atomique, Paris and Societe Nationale elf Aquitaine, Courbevoie, both of, France

Filed Feb. 13, 1978, Ser. No. 877,587
Claims priority, application France, Feb. 18, 1977, 77 04657
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—45 35 Claims



1. A heat transfer system for the utilization of cavities dug in the subsoil as heat silos by circulating a heat-transporting liquid on the one hand for the introduction of heat into one or a number of cavities which have been dug in the subsoil and the available internal capacity of which is normally filled with said heat-transporting liquid during the utilization stages and on the other hand for the extraction of heat from said cavity or cavities, wherein said system comprises in combination:

a circulation and heat exchange circuit comprising suitable pumping means, heat exchange means and flow regulation means which make it possible at the time of heat storage to carry out extraction of the heat-transporting liquid at low temperature at the lower end of the cavity or cavities, heating of said liquid by heat exchange with an external fluid and reinjection of said liquid at the upper end of the cavity or cavities and, at the time of heat recovery, to carry out extraction of the heat-transporting liquid at high temperature at the upper end of the cavity or cavities, cooling by heat exchange with an external fluid and reinjection of said liquid at the lower end of the cavity or cavities, said circulation and heat exchange circuit including at least one pipe line leading to the top of the cavity or cavities having at least one flow-arresting valve therein constituted by a normally-closed valve caused to open by the pressure within the cavity or cavities or constituted by any other equivalent device for isolating the top of the cavity or cavities from the remainder of the system if the internal pressure at the top of the cavity or cavities becomes lower than a minimum operating pressure which is in turn slightly higher than the vapor pressure of the heat-transporting liquid at the maximum storage temperature and appreciably lower than the reference pressure aforesaid;

at the top portion of the cavity, a purge device comprising a small auxiliary chamber containing a predetermined quantity of air or of gas;

within the interior of the cavity or each cavity, two equipment units for injection and recovery of the heat-transporting liquid, one unit being located in the top portion of the cavity and the other unit being located in the bottom portion of said cavity;

expansion means comprising at least one expansion reservoir at atmospheric pressure which is put into communication with the base of the cavity or each cavity by means of a system of pipe lines for transferring the heat-transporting liquid having pressurization and pressure relief means;

a safety unit comprising a filling check-valve or any like device for allowing the heat-transporting liquid to pass freely from the expansion means to the cavity or each cavity while completely preventing flow in the opposite direction.

4,190,100

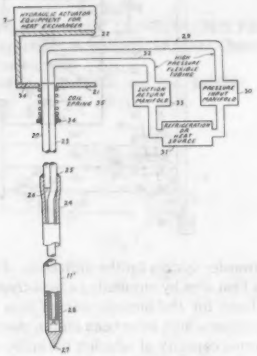
INTERNAL HEAT EXCHANGER FOR MEAT

Charles H. Wallace, Carrollton, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,711

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—48 R **24 Claims**



1. (Amended) An internal heat exchanger for meat comprising: [at least one] *a plurality of* recirculating needles *disposed in a predetermined pattern, each of said plurality of needles* including an outer tube having one end thereof terminated in a closed needle point [;] , and an inner tube disposed within said outer tube having one open end thereof spaced from said needle point and providing a predetermined clearance along its length between the outer wall of said inner tube and the inner wall of said outer tube; *an input manifold common to said predetermined clearance of each of said plurality of needles to supply a pressurized heat transferring medium to each of said plurality of needles; and a return manifold common to said inner tube of each of said plurality of needles to remove said heat transferring medium from each of said plurality of needles.*

4,190,101

HEAT EXCHANGER TUBE BASE

Werner Hartmann, Immenstaad, Fed. Rep. of Germany, assignor to Swakopmund AG, Diesbach, Switzerland

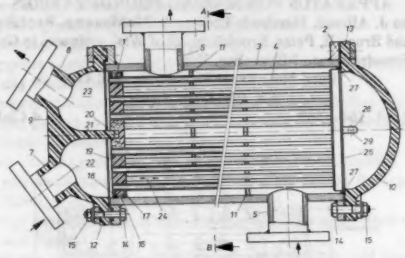
Filed Mar. 22, 1977, Ser. No. 780,067

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612514

Int. Cl.[2] F28F *9/02*

U.S. Cl. 165—82 **4 Claims**

1. An improved tube base (**1, 2**) for a bundle-type heat exchanger and an inner wall of a casing (**3**) of the exchanger, for cooperation with a tube bundle (**4**) of the exchanger; the tube base consisting of a poly laurin lactam material that has an elastic return capacity up to about 80%, a unit of thermal expansion coefficient of 0.8 to 1.0×10^4 per degree Celsius at $-60°$ to $+30°$ C., and 1.0 to 1.9×10^4 per degree Celsius at $+30°$ to $+100°$ C., which unit is higher than that of the tubes in said bundle and of said casing; said bundle being entirely cast at least at one end into said material in a gapless manner; said material also acting as sealing means (**17, 18**) between said tubes and the tube base, on the one hand, and the tube base and an inner wall of said casing, on the other hand; wherein a contour of a covering face of the tube base, which face is opposite said inner wall, is profiled to have a peripheral curved



portion (**16**) for the formation of at least one sealing edge (**17, 18**) that forms part of said sealing means.

4,190,102

AIR COOLED CONDENSER INSTALLATION

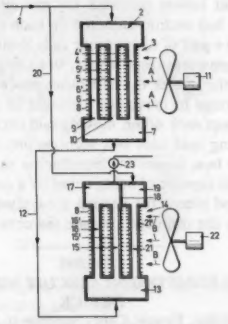
Hans-Bernd Gerz, Bochum, Fed. Rep. of Germany, assignor to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG, Herne, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,660

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1978, 2800287

Int. Cl.[2] F28B *7/00*

U.S. Cl. 165—113 **8 Claims**



1. An air cooled condenser installation comprising first heat exchange means comprising a plurality of rows of substantially upright tubes adapted to be impinged by a stream of cooling air in a direction transverse to the longitudinal direction of the tubes, each of the tubes having an upper and a lower open end; an upper manifold communicating with the upper open ends of said tubes; a lower collecting chamber communicating with the lower open ends of said tubes; a steam conduit communicating with said upper manifold so that steam passing therethrough flows downwardly through said tubes to partly condense with the thus-formed condensate flowing likewise downwardly into said lower collecting chamber; second heat exchange means comprising a plurality of second rows of substantially upright tubes adapted to be impinged by a second stream of cooling air flowing transverse to the elongation of said second tubes, each of said tubes in said second rows having an upper and a lower open end; a lower distribution chamber communicating with the lower open ends of the tubes of said second rows; an upper distribution chamber communicating with the upper open ends of the tubes of said second rows; a connecting steam conduit connecting said lower collecting chamber of said first heat exchange means with said lower distribution chamber of said second heat exchange means so

that steam which has not been condensed in said first heat exchange means flows upwardly through said tubes of said second rows of tubes from said lower to said upper distribution chamber to thereby condense with the thus-formed condensate flowing in countercurrent direction to the steam; said second heat exchange means including further a plurality of additional substantially upright tubes having each an upper and a lower open end and being arranged in front of the tubes of said second rows to be first impinged by said second stream of cooling air, said additional tubes communicating at the lower ends thereof with said lower distribution chamber; and a branch conduit branching off from said steam conduit and communicating with the upper open ends of said additional tubes so that steam passing therethrough flows downwardly through said additional tubes and condenses with the thus-formed condensate flowing in the same direction as the steam.

4,190,103

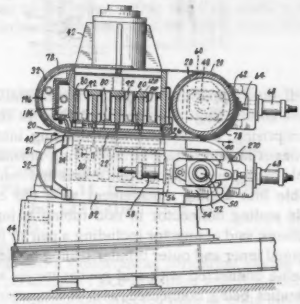
CONTINUOUS CASTING OF METAL STRIP BETWEEN MOVING BELTS

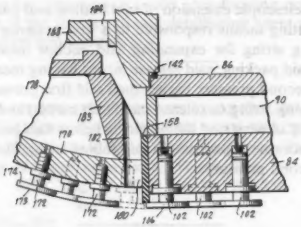
Olivo G. Sivilotti; David E. Steer, and Thomas A. C. Stock, all of Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Division of Ser. No. 568,320, Apr. 15, 1975, Pat. No. 4,061,178. This application Sep. 20, 1977, Ser. No. 834,969

Int. Cl.² B22D *27/02*; F28F *25/06*

U.S. Cl. 165—120 **2 Claims**





1. An apparatus comprising, in combination with means providing a surface which moves in a desired path and which is to be cooled: a multiplicity of elements having closely spaced faces lying in and distributed throughout a non-traveling surface which substantially conforms with said path over a predetermined area and which is arranged so as to provide a slight spacing between said non-traveling and said moving surfaces, each of said elements having a central jet aperture through its face for directing liquid coolant against the moving surface, and means for supply of liquid coolant under pressure to the jet apertures and for withdrawal of liquid coolant from spaces between the element faces, said elements and said coolant supply and withdrawal means being constructed and arranged so that liquid coolant flows outward from each jet of the elements against and in covering relation to the moving surface, forming a coolant layer filling the slight spacing between the element faces and the moving surface, and is withdrawn through the said spaces between the element faces; said apparatus further including means for mounting each of said elements to be movable individually toward and away from the aforesaid predetermined path, and means loading each element toward said path, said loading means being resiliently yieldable so that each element can be individually moved in the direction away from said path upon displacement of the moving surface in said direction, exerting force through said coolant layer against the face of the element.

4,190,104

HEAT EXCHANGER HAVING HELICALLY WOUND TUBE COILS

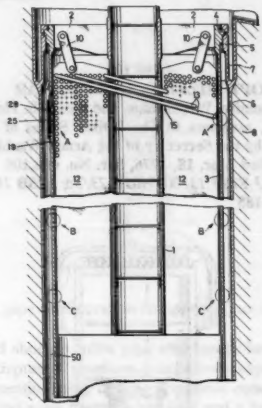
Arno Frei, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 10, 1977, Ser. No. 850,195

Claims priority, application Switzerland, Nov. 17, 1976, 14442/76

Int. Cl.² F28D *7/02*; F22B *37/24*

U.S. Cl. 165—162 **14 Claims**



1. A heat exchanger comprising

a plurality of radially oriented and vertically disposed support plates;

a plurality of helically wound tube coils mounted in said support plates in concentric relation to each other;

a vertically disposed cylindrical jacket peripherally disposed about said support plates and said tubes;

at least one slot disposed in said jacket near each of said plates; and

at least one shoe mounted on each of said plates each of said shoes being guided in one of said slots, said slot having an axial length longer than the axial length of said shoe to permit axial movement of said support plates relative to said jacket.

4,190,105

HEAT EXCHANGE TUBE

Gerhard Dankowski, Rte. 2, Box 59A, Royse City, Tex. 75089

Continuation-in-part of Ser. No. 713,352, Aug. 11, 1976, Pat. No. 4,063,431. This application Sep. 9, 1977, Ser. No. 831,735

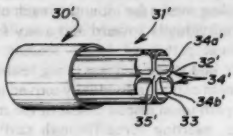
Int. Cl.² F28F *3/12*

U.S. Cl. 165—179 **6 Claims**

1. An insert for a heat exchange tube, comprising:

a plurality of fins depending from a common core, said fins

each having curved bifurcated ends remote from said core, said bifurcated ends of said fins being tapered and flexible to be curved in opposite directions upon insertion



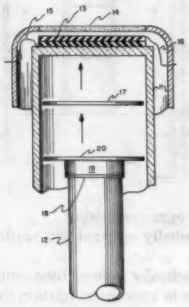
of the insert into the tube such that said ends are in heat exchange contact with the inside surface of the heat exchange tube.

4,190,106

OPTIMIZED COOLER DEWAR

Howard L. Dunzaire, Woodbridge, and Stuart B. Horn, Fairfax, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1976, Ser. No. 668,109
Int. Cl.[2] F28F *13/00*; H01L *23/36*; F25B *19/00*
U.S. Cl. 165—185 **8 Claims**



1. A cryogenic coupling between a cold finger and a low temperature dewar comprising:

a first planar, solid, highly malleable and highly heat conductive transition member pressed into the surface of said dewar;

a second highly conductive, thin, rigid, metallic transition member conductively bonded to said cold finger;

a third transition member comprising a continuous mat of highly heat conductive resilient interwoven fibers filling the major portion of the space between said first and second transition members, said fibers being sufficiently compressed to make firm contact with one another and being bonded to at least one of said transition members; and

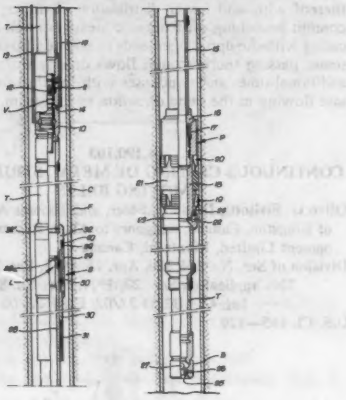
a fourth thin rigid highly conductive metallic interface member is conductively bonded to said third transition member between said first and third transition members.

4,190,107

WELL BORE APPARATUS WITH HYDRAULICALLY RELEASABLE TUBING SEAL UNIT

Jerome H. Oden, Houston; Roy E. Swanson, Jr., Sugar Land, and Ronald J. Vondall, Sulphur Springs, all of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Aug. 25, 1978, Ser. No. 936,851
Int. Cl.[2] E21B *23/04, 17/02*
U.S. Cl. 166—120 **7 Claims**



1. Well bore apparatus adapted to be installed in a well casing for conducting produced well fluid to the top of the well, comprising: a tubing string extending into the casing; packer means in said tubing string having normally retracted expansible casing engaging anchor means and resilient packing deformable into sealing engagement with the casing; and a releasable sealing connector in said tubing string above said packer means; said connector including a pair of telescopically interengaged inner and outer tubular sealing bodies; one of said bodies being connected with said packer means and the other of said bodies being connected with the upwardly extended tubing string; releasable latching means retaining said bodies in a telescopically contracted condition; and fluid pressure responsive release means operable to release said latching means enabling telescopic extension of said bodies; said packer means having setting means responsive to a first pressure of fluid in said tubing string for expanding said anchor means and deforming said packing; said release means having means responsive to a second pressure higher than said first pressure of fluid in said tubing string to release said latch means; and means for temporarily closing said tubing string below said packer means to allow increase of pressure in said tubing string from said first to said second pressures.

4,190,108

SWAB

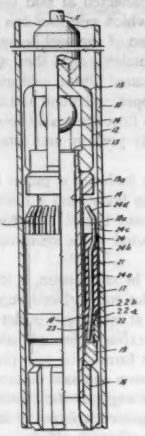
Jack C. Webber, 1721 Blalock, Houston, Tex. 77055

Filed Jul. 19, 1978, Ser. No. 925,987
Int. Cl.[2] E21B *37/00*
U.S. Cl. 166—202 **21 Claims**

1. A swab cup comprising, a sleeve shaped body of resilient material with circumferentially spaced reinforcing wires, all of said wires spaced inwardly from the outer diameter of the body along a major portion of its length to permit the body to have fluid film lubrication with a tubing,

said wires at their upper sections having sled portions at the

outer diameter of the cup for engaging the wall of a tubing and bridging couplings in the tubing, and



a restraining ring at the lower end of the cup limiting radial movement of the wires within the ring while permitting limited outward movement of the wires above the ring.

4,190,109

INTRODUCTION AND SELECTIVE REMOVAL OF DEBILITATING AGENT FOR PERMEABILITY CORRECTION

Hugh M. Barton, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 11, 1978, Ser. No. 950,752
Int. Cl.[2] E21B *33/138, 43/22*
U.S. Cl. 166—270 **12 Claims**

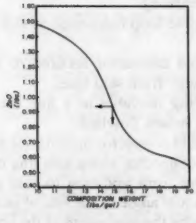
1. A process comprising:
(a) injecting into a subterranean formation having zones of varying permeability a composition which is a debilitating agent for a subsequent injected plug-forming composition;
(b) thereafter introducing a fluid flush material under conditions so as to selectively remove said debilitating agent from the more permeable zones of said formation; and
(c) thereafter introducing a said plug-forming composition which in the absence of said debilitating agent provides a fluid diversion composition.

4,190,110

METHOD OF CEMENTING WELLBORES USING HIGH TEMPERATURE CEMENT MUD SPACER

Robert M. Beirute, Fort Worth, Tex., assignor to The Western Company of North America, Ft. Worth, Tex.

Filed May 19, 1978, Ser. No. 907,568
Int. Cl.[2] E21B *33/16*
U.S. Cl. 166—291 **6 Claims**



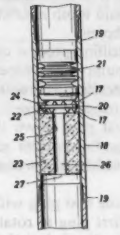
1. A method for cementing wellbores which contain a drilling fluid comprising introducing an amount of a spacer composition into said wellbore prior to introduction of the cement composition, said spacer composition being present in an amount effective to prevent contact of said cement with said drilling fluid and said spacer composition comprising an aqueous suspension of attapulgite clay stabilized with an effective amount of zinc oxide and having a pH of at least about 7.

4,190,111

WELL CEMENTING/PLUG DRILLING APPARATUS AND IMPROVED CEMENTING AND DRILLING PROCESS

Carl A. Davis, P.O. Box 12326, Houston, Tex. 77017

Filed Sep. 11, 1978, Ser. No. 941,161
Int. Cl.[2] E21B *17/14, 33/16*
U.S. Cl. 166—291 **15 Claims**



8. A well pipe configuration comprising, moving up the pipe string:
(a) a well shoe or collar pipe attachment having a cement tube adapted to receive a pump down wipe plug;
(b) a cementing/plug drilling apparatus comprising a drillable rigid plate having a top face and a bottom face and having at least one drillable top protrusion upward from the top face and at least one drillable bottom protrusion protruding downward from the bottom face, said bottom protrusion in contact with the top of the cement tube, and
(c) a pump down wipe plug, the bottom of the plug in contact with the top protrusions of the apparatus of b).

11. In the process of cementing within a well and drilling through a pump down wipe plug comprising pumping a desired amount of wet cement into the cementing string, followed by a pump down wipe plug at the interface of the wet cement and the fluid used to force the cement to the desired level, forcing the cement and plug down the string until the plug contacts the cement tube of a well shoe or collar pipe attachment, allowing the cement to harden, then drilling out the plug with a rotating drill bit, the improvement which comprises introducing a cementing/plug drilling apparatus between the cement tube and the pump down wipe plug said apparatus comprising a drillable rigid plate having a bottom face and a top face and at least one drillable protrusion protruding from each face, contacting the top of the plug with a rotating drilling bit, forcing the protrusion on the top face to engage the bottom of the plug and the protrusion on the bottom face to engage the top of the cement tube thereby retarding the tendency of the plug to rotate with the rotating bit and enhancing the drilling action of the bit.

4,190,112
PUMP DOWN WIPE PLUG AND CEMENTING/DRILLING PROCESS
Carl A. Davis, P.O. Box 12326, Houston, Tex. 77017
Filed Sep. 11, 1978, Ser. No. 941,162
Int. Cl.[2] E21B *33/16*
U.S. Cl. 166—291 **16 Claims**

12. An improved down hole well pipe configuration comprising:

(a) a well shoe or collar pipe attachment, and

(b) a pump down wipe plug having at least one drillable bottom tooth made of a material selected from the group consisting of cast iron and aluminum protruding from its bottom surface, said tooth in contact with the top surface of the pipe attachment.

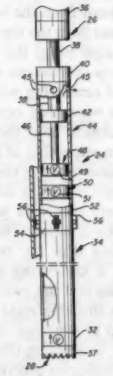
15. An improved drilling process comprises:

(a) inserting a first pump down wipe plug having at least one drillable tooth extending below the bottom surface, into a cementing pipe string;

(b) pumping the first plug down the pipe string until the tooth or teeth on the bottom surface of the first plug contact the top surface of a second plug or shoulder of a collar or shoe;

(c) and drilling out the first plug with a rotating drill bit, the tendency of the first plug to rotate being retarded by the tooth or teeth extending below the bottom of the first plug and engaging the top surface.

4,190,113
WELL CLEANOUT TOOL
Wayne O. Harrison, 218 W. 465th St., Odessa, Tex. 79762
Filed Jul. 27, 1978, Ser. No. 928,532
Int. Cl.[2] E21B *37/00*
U.S. Cl. 166—311 **8 Claims**



1. A well cleanout tool, comprising; an elongated main body having a lower inlet end into which fluid and debris may flow, and an upper outlet end having means by which fluid may be returned to the wellbore; said inlet end being spaced from said outlet end;

support means connected at said upper outlet end of the main body by which said tool can be supported, the medial body portion of the tool being an elongated, hollow member for containing well fluid and debris;

a pump means located within said main body at a location between said upper outlet end and said lower inlet end for forcing fluid to flow from said lower inlet end, through said medial body portion, and through said upper outlet end;

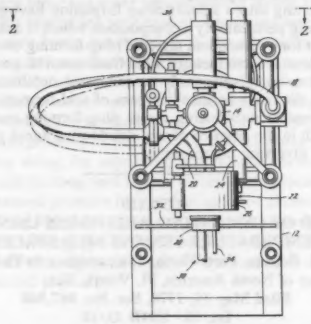
said pump means includes a pump barrel axially formed within said main body, and a piston reciprocatingly received within said barrel, a piston rod by which said piston is connected to be reciprocated by said support means;

a traveling valve in said piston, a standing valve located between said inlet end and said pump barrel;

a closure member at said upper outlet end; means by which said piston rod extends through said closure member; an abutment means formed on said piston rod at a location between said piston and said closure member so that the abutment means engages the closure member when the piston is reciprocated uphole by said support means to thereby provide a jarring effect;

a trap means located between said lower inlet end and said medial body portion through which fluid and debris may flow while said pump forces fluid to flow through said tool.

4,190,114
SUBSEA WELLHEAD APPARATUS
Edmund A. Fisher, and Frank P. Czerewaty, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.
Filed Aug. 18, 1978, Ser. No. 934,687
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—346 **5 Claims**



1. An apparatus for connecting a subsea christmas tree to a subsea flowline, comprising

a production flowline loop connected to the christmas tree, and

a remotely actuated connector secured to the end of the flowline loop away from said tree,

said connector being movable in a line for engaging and connecting to a subsea flowline,

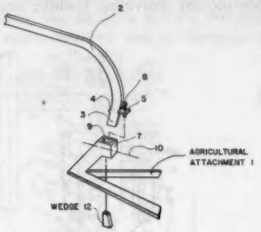
the movement of said connector moving the end of said loop secured to said connector along said line of movement,

said loop extending from said tree to said connector in a plane at a substantial angle to the line of movement of said connector whereby the movement of the connector end of said loop causes predominantly torsional stresses in said loop.

4,190,115
FOR RELEASABLY COUPLING AGRICULTURAL ATTACHMENT TO SHANK

Richard B. Couture, Box 64, Ferland, Sask., Canada (S0H 1MO)

Filed May 15, 1978, Ser. No. 906,040
Int. Cl.² A01B 15/00
U.S. Cl. 172—753 **2 Claims**



1. A coupling for releasably coupling an agricultural attachment to a shank, said coupling comprising

a curved rectangular rod-like shank having a free end, said shank being substantially linear in the area of its free end and having a lip projecting from one side thereof in the area of its free end and a coupling member projecting from the opposite side thereof, said coupling member having an internally threaded bore formed therethrough;

an agricultural attachment for performing an agricultural task, said attachment having a coupling end of rectangular sleeve type configuration accommodatable on said shank with additional space therein at the free end thereof up to said projecting lip and coupling member;

a bolt threadedly coupled in the bore of the coupling member of the shank; and

a wedge having an internally threaded bore formed therein for accommodating said bolt whereby when the coupling end of said attachment is positioned on the free end of said shank in abutment with said lip and said wedge is positioned in the hole of said coupling end next-adjacent said shank and said bolt coupled in said coupling member is threadedly coupled in said wedge, said attachment is removably tightenable on said shank via said bolt and said wedge.

4,190,116
MINE ROOF BOLTER

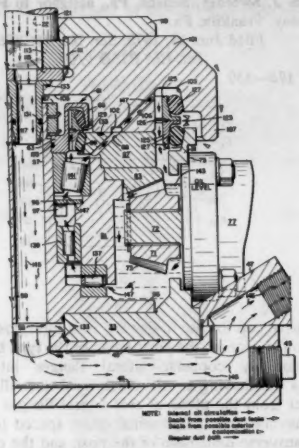
Winston R. O'Neal, Fayetteville, and Stephen L. Richardson, Oak Hill, both of W. Va., assignors to Black Diamond Service Company, Inc., Fayetteville, W. Va.

Filed May 3, 1978, Ser. No. 902,397
Int. Cl.² E21C 5/00
U.S. Cl. 173—38 **19 Claims**

1. In a rotary drill head apparatus for a mine roof bolter having a central dust suction means, a drill-bit-engaging means, a pinion-and-ring gear driving means, and inner and outer oil cavities within which bearings are rotatively operable, the improvement of a circulatory lubricating means, comprising:

A. an oil lift means for lifting oil upwardly from said inner oil cavity, said oil lift means comprising an oil lift ring having at least one finger which is downwardly inclined toward the direction of rotation, and said oil lift means being rotatively operable within said inner oil cavity for said lifting of said oil upwardly; and

B. an oil movement means for upwardly and radially moving said oil to a position above said outer oil cavity, whereby said oil falls past said pinion-and-ring gear driving means, said oil movement means comprising a plurality of diagonally and radially disposed oil passageways that are formed in a seal plate and in a chuck which are rigidly

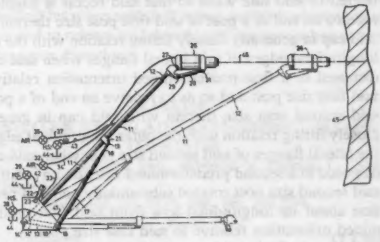


attached to and supported by a cylindrical hub which separates said inner oil cavity from said outer oil cavity.

4,190,117
SUPPORT AND POSITIONER FOR ROCK DRILL

Donald R. MacLean, 60 Duncan St., Thornbury, Ontario, Canada (N0H 2P0)

Filed Sep. 12, 1978, Ser. No. 941,582
Int. Cl.² E21C 5/00
U.S. Cl. 173—43 **9 Claims**

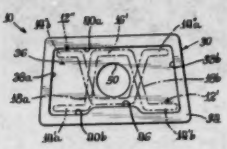


1. Support and positioner apparatus for a rock drill comprising a feed boom pressure cylinder and piston, means for selectively applying fluid pressure at the upper and lower ends of the pressure cylinder whereby the piston can be extended and retracted along its axis, a mounting for a rock drill pivotally connected on the upper end of the feed boom piston, a base plate adapted for connection on a mobile carrier, a boom-elevating extendable and retractable pressure cylinder and piston pivotally connected between the base plate and an intermediate part of the feed boom cylinder, a valve controlling flow of pressure fluid to and from the elevating cylinder whereby the feed boom cylinder can be raised to an elevated angle of inclination and can be lowered, a linkage pivotally connected on a lower end of the feed boom cylinder and extending downwardly from the feed boom cylinder and laterally of the axis of the feed boom piston to a lower pivot point on the base plate located laterally of and below the axis of the feed boom piston and means retaining said linkage at a predetermined angle to said axis, said feed boom piston and cylinder rocking bodily downwardly and forwardly about said lower pivot point.

4,190,118
DRIVE CAP

Lawrence J. Sweeney, Seneca, Pa., assignor to Franklin Steel Company, Franklin, Pa.

Filed Jun. 19, 1978, Ser. No. 916,856
Int. Cl.[2] B25D 9/00
U.S. Cl. 173—130 6 Claims



1. A drive cap for use in driving structural posts longitudinally into the ground, the posts being of the type having a pair of substantially coplanar lateral flanges interconnected through a web having a wall which is substantially parallel to and offset from the plane of said lateral flanges, said lateral flanges having outer longitudinal edges spaced to define the major transverse dimension of the post, and the plane of said lateral flanges being spaced from the plane of said wall to define the minor transverse dimension of the post,

said drive cap being adapted for use with posts of different transverse size wherein a first size post has major and minor transverse dimensions greater, respectively, than the major and minor transverse dimensions of a second size post,

said drive cap comprising a drive block having a longitudinal axis and upper and lower ends and defining a recess therein intersecting one of said ends,

said recess being defined by nonparallel laterally spaced side walls and mutually facing front and rear walls interconnected to said side walls so that said recess is adapted to receive an end of a post of said first post size therein with said cap in generally closely fitting relation with the outer longitudinal edges of said lateral flanges when said cap is disposed in a first predetermined orientation relative to said first size post and so as to receive an end of a post of said second post size therein with said cap in generally closely fitting relation with the outer longitudinal edges of the lateral flanges of said second size post when said cap is disposed in a second predetermined orientation relative to said second size post rotated substantially one-half revolution about its longitudinal axis from said first predetermined orientation relative to said first size post,

the other end of said drive cap facilitating impacting of said cap by an external force to drive said first or second size posts into the ground when said cap is mounted thereon.

4,190,119
EARTH DRILLING APPARATUS

James B. Loftis, and Norlin O. Lewis, both of Remlap, Ala., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 12, 1977, Ser. No. 859,613
Int. Cl.[2] B23Q 5/00; E21C 5/00
U.S. Cl. 173—149 3 Claims

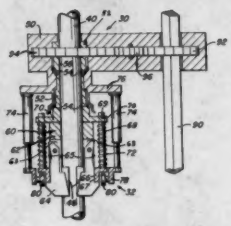
1. An improved drilling machine comprising:

a frame;

an elongated drill mast having one end connected to said frame;

a rotary drive means adapted to reciprocably move on at least a major portion of said mast and having an axis of rotation disposed generally parallel to said mast and including an elongated rotor having a through bore coaxial with said axis of rotation for receiving therewithin a longitudinally extending drill string of a length greater than the height of said mast, said drill string being provided with pairs of rectangular shaped notches longitudinally spaced there along;

said rotary drive means further including a pair of oppositively disposed pivotable latches mounted on said rotor and an actuator assembly selectively moveable between first and second positions, said latches being adapted to mate with said notches, movement of said assembly to its first position pivots said pair of latches into mating relationship with a corresponding pair of said drill string notches thereby providing positive engagement of said rotary drive means with said drill string whereby rotational and longitudinal motion are imparted to said drill string under conditions wherein said rotary drive means is reciprocably moved along said mast, movement of said assembly to its second position pivots said latches out of engagement with said notches such that said rotary drive means is free to move along said drill string as it is reciprocated along said mast during the drilling operation; and

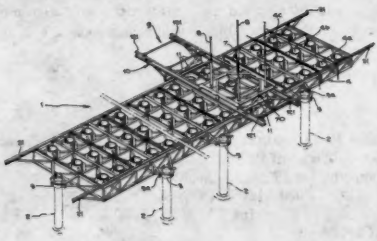


means for reciprocating said rotary drive means along said mast.

4,190,120
MOVEABLE GUIDE STRUCTURE FOR A SUB-SEA DRILLING TEMPLATE

A. Michael Regan, Huntington Beach, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

Filed Nov. 18, 1977, Ser. No. 852,908
Int. Cl.[2] E21B 7/12
U.S. Cl. 175—7 35 Claims



1. A subsea template and movable guide structure assembly for conducting subsea drilling and production operations selectively between a plurality of adjacent subsea wells comprising:

a subsea well template having a plurality of template sections arranged in a longitudinally extending array, each of said sections having a plurality of well bore guide means in laterally spaced series relative to the longitudinal extent of said template;

tool guide means for guiding a subsea well tool into a well bore guide means;

carriage means and means for movably mounting said carriage means to said template, said carriage means movably mounting said tool guide means on said template for movement along the longitudinal extent thereof, whereby,

said tool guide means may be positioned with regard to selected ones of said sections.

4,190,121

THERMAL DRILLING DEVICE

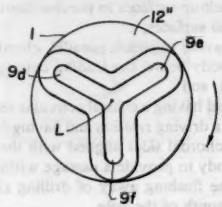
Werner Baum, Flein, and German Munding, Bad Friedrichshall, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Division of Ser. No. 734,424, Oct. 21, 1976, Pat. No. 4,076,082. This application Jan. 24, 1978, Ser. No. 871,822

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2607046

Int. Cl.² E21B *7/14*

U.S. Cl. 175—14 **2 Claims**



1. A thermal drilling device operating in a rotary motion, particularly for drilling geological formations, comprising a drill body having an interior combustion chamber with a bottom having an outlet defining a discharge nozzle, said drill body being rotatable about an axis of rotation, means for generating hot gaseous products of combustion in said combustion chamber, said discharge nozzle having a plurality of radially extending slots which intersect at the center of said drill axis of rotation and define discharge openings for the hot gases.

4,190,122

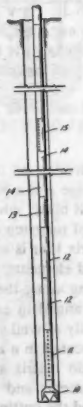
SPACED WEIGHT RELIEVED DRILL COLLAR STRING

James F. Arnold, 241 Kilts Dr., Houston, Tex. 77024

Filed Mar. 22, 1978, Ser. No. 888,837

Int. Cl.² E21B *17/00*

U.S. Cl. 175—320 **12 Claims**



1. For use in the drilling of a well, a string of drill collars adapted to be connected in a drill string, said drill collar string having its weight symmetrically disposed about its centerline except for a plurality of straight tubular sections vertically spaced apart along its length with a major portion of said sections being separated by at least one drill collar which has its weight symmetrically disposed about its centerline as aforesaid and each section being weight relieved along one side thereof to produce an eccentric weighting of the section corresponding to 0.5 to 10 percent of the original weight of said section.

4,190,123

ROCK DRILL BIT LOADING DEVICE

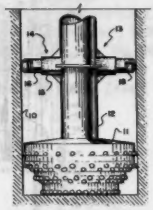
John Roddy, 312 Laidlaw Blvd., Winnipeg, Manitoba, Canada

Filed Jul. 14, 1978, Ser. No. 924,625

Claims priority, application United Kingdom, Jul. 20, 1977, 30482/77

Int. Cl.² E21B *17/10*

U.S. Cl. 175—325 **14 Claims**



1. A rock drill bit loading device in which said drill bit is mounted on the lower end of a rotatable drill string within a bore hole and includes a source of hydraulic pressure and a source of drilling fluid within said drill string, comprising in combination at least two bore hole wall engaging assemblies extending radially outwardly from the wall of the drill string and rotating therewith, means to apply outward pressure to said assemblies, to engage same with the wall of the bore hole and means to translate the frictional engagement of said assemblies with the wall of the bore hole, to downward pressure upon the drill bit when said drill string and bit is rotating in one direction and to release said downward pressure when rotating in the opposite direction.

4,190,124

STABILIZER AND BLADE ATTACHMENT MEANS THEREFOR

Robert G. Terry, Odessa, Tex., assignor to Thomas L. Taylor, Odessa, Tex.

Filed Oct. 23, 1978, Ser. No. 954,044

Int. Cl.² E21B *9/22.*

U.S. Cl. 175—406 **17 Claims**

1. A stabilizer of generally cylindrical configuration having means at the upper and lower end thereof by which the stabilizer can be connected in series relationship with respect to a drill string; an axial flow passageway formed through said stabilizer through which drilling fluid can flow;

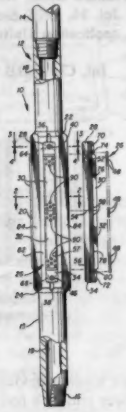
said stabilizer having a central body within which a plurality of elongated, outwardly opening, radially spaced slots are formed; each said slot being spaced circumferentially from the nearest adjacent slot; each said slot having opposed sidewalls and opposed endwalls, and a bottom spaced from said axial flow passageway; said opposed sidewalls extend from said bottom to the outer peripheral surface of said central body;

a cutting blade having opposed ends, opposed sidewalls, and a front and a rear face; means on said front face for reaming the inside peripheral wall surface of a borehole true; one said blade being received within one said slot in close tolerance relationship therewith, the sidewalls of said blade being closely adjacent to the sidewalls of said slot;

an elongated, longitudinally extending, circular groove formed on each said opposed wall surface of said slot and on each said opposed sidewall of said blade; one said

groove, when said blade is received within said slot, registers with another said groove to form a cylindrical passageway, said passageway having an inlet end and an outlet end, a closure means for said inlet end and said outlet end;

and a plurality of holding balls removably received within said cylindrical passageway, said balls have an outside diameter to be admitted within said cylindrical passageway;



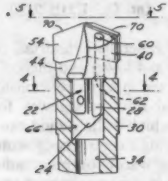
one said blade can be received within one said slot, said plurality of holding balls can be forced through said inlet end of said passageway until said passageway is substantially filled with balls, the closure means positioned to isolate the balls within the passageway where each of the balls simultaneously bear against the circular groove of the slot and the circular groove of the blade, thereby holding the blade within the central body.

4,190,125

DRILL BIT AND STEEL COMBINATION FOR IMPROVED FLUID FLOW

Kenneth C. Emmerich, and Ralston L. Hamlin, both of Lexington, Ky., assignors to Fansteel Inc., North Chicago, Ill.

Filed Nov. 9, 1977, Ser. No. 849,995
Int. Cl.[2] E21C *13/10, 15/00*
U.S. Cl. 175—410 **4 Claims**



1. In combination, a mining drill bit and driving steel for rotary and rotary percussion drilling of hard materials such as rock, coal, concrete and the like which comprises:

(a) a central metallic, heat conductive body generally round in cross-section and having a central axis,

(b) an acircular driving shank of substantially smaller diameter than said body axially disposed on one end of said body having a cooling passage formed therein extending to said body,

(c) a hard metal cutting insert supported diametrically at the other end of said body comprising a flat elongate member having leading cutting edges on the top of said member on opposite sides of the axis of said body and on opposite sides of the member with a clearance angle surface angled downward from the leading edge toward a trailing edge on each side of the member,

(d) support prongs extending axially of said body in diametrically opposed quadrants having ledge surfaces in contact with the bottom of said insert and back-up, axially extending chordal surfaces in contact with a trailing side of said insert, said insert being brazed to said prongs at said ledge and back-up surfaces,

(e) passages formed in said prongs in communication with a shank passage extending axially to the distal end of said prongs and passing behind and adjacent to said back-up chordal surfaces and terminating adjacent the cutting edges of said insert and to conduct heat away from said ledge and back-up surfaces to prevent destructive heating of said brazed surfaces,

(f) said body having opposed, parallel, chordal sides at the base of the body below the leading cutting edges of said cutting insert, and

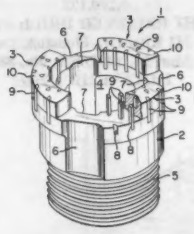
(g) a driving steel having a central acircular recess to receive said shank in a driving relation and having opposed, parallel, external chordal sides aligned with the chordal sides on said bit body to provide a passage within a hole being drilled for the flushing away of drilling chips and fines toward the mouth of the hole.

4,190,126

ROTARY ABRASIVE DRILLING BIT

Ryuichi Kabashima, Yokohama, Japan, assignor to Tokiwa Industrial Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1977, Ser. No. 862,393
Claims priority, application Japan, Dec. 28, 1976, 51-159141
Int. Cl.[2] E21B *9/16*
U.S. Cl. 175—410 **5 Claims**



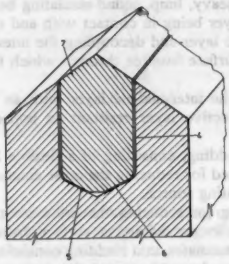
1. A rotary abrasive drilling bit comprising a bit body attached to a rotary drill pipe and a plurality of teeth equipped on the fore part of said bit body, wherein each of said teeth is composed of a plurality of tungsten carbide thin sticklike cutting elements and a matrix that is softer than and inferior in abrasion resistance to said elements, all said sticklike tungsten carbide elements extending along the cutting direction of said bit body and orderly arranged in each tooth with a desired space therebetween radially as well as circumferentially of the bit body with the ends located in a zig-zag path transverse to said cutting direction, said matrix surrounding the tungsten carbide thin sticklike elements and maintaining them in the aforesaid arrangement, and the cutting face of said tooth being composed of a compound surface consisting of the end faces of the tungsten carbide thin sticklike elements and the surface of the matrix, whereby when the edges of the tungsten carbide thin sticklike elements are worn down and shortened with the progress of drilling work the surface of the matrix is also worn down to the same extent in concert therewith to maintain the teeth suitable for drilling purposes.

4,190,127

BRAZING INSERTS

Isaac M. Wolf, 18 Hollinger Ave., Springs, Transvaal, South Africa

Filed Jan. 19, 1978, Ser. No. 870,807
Claims priority, application South Africa, Jan. 20, 1977, 77/0339
Int. Cl.[2] B23K *1/04*
U.S. Cl. 175—410 11 Claims



1. A rock working tool having a bit portion having a recess for a cutting insert with the floor of the recess being formed with a downward taper to the center, and a hard metal insert having a base which is complementally tapered to the base of the recess brazed into the recess with a greater thickness of brazing material between at least two opposite sides of the insert and the recess than between the bases of the insert and recess.

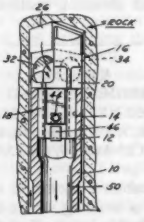
11. A method of brazing a parallel-sided insert for a rock working tool into a parallel-sided recess in the tool including the steps of shaping the base of the recess and the base of the insert to complemental gabled shapes so that when the insert is located in the recess, the insert is automatically centrally located in the recess, positioning the insert in the recess with the base of the insert resting on the base of the recess so that the insert is gravitationally centered in the recess, and causing molten brazing medium to flow into the spaces between the insert and recess to hold the insert in the recess.

4,190,128

ROOF DRILL BIT WITH HEXAGONAL BODY PORTION

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.

Filed Dec. 21, 1978, Ser. No. 971,844
Int. Cl.[2] E21C *13/00*
U.S. Cl. 175—410 5 Claims



1. A mining drill bit for rotary and rotary percussion drilling of hard materials such as rock, coal, concrete and the like which comprises:

(a) a generally cylindrical metallic body having a base portion with a polygonal shape in cross-section with flat sides,

(b) an acircular driving shank of substantially smaller diameter than said body axially disposed on one end of said body having a cooling passage formed therein extending to said body,

(c) support prongs extending axially on said base portion in diametrically opposed quadrants having aligned ledge surfaces to support a bottom of a cutting insert and axially extending chordal surfaces in contact with trailing sides of said insert on opposite sides of the center of said body,

(d) an insert secured to surfaces of said prongs,

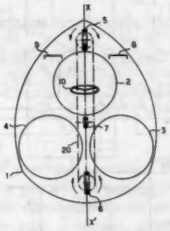
(e) the remaining quadrants in said body being formed to provide chip slash openings extending into said base portion to form ports connecting the cooling passage of said shank with said slash openings.

4,190,129

AIR CUSHION BUMPER CARS

Dominique Mary, lieu dit "La Souche", 76500 Elbeuf, France

Filed May 9, 1978, Ser. No. 904,343
Claims priority, application France, May 18, 1977, 77 16223
Int. Cl.[2] B60V *1/14*
U.S. Cl. 180—119 5 Claims



1. A ground effect vehicle comprising: a chassis having a longitudinal axis; front, middle and rear wheels arranged along the said longitudinal axis and each having an axle, the axle of said middle wheel being fixed at right angles to the said axis and the said middle wheel being an idler wheel; means for pivoting the axles of the front and rear wheels to orientate the said axles simultaneously in any same direction in a plane containing the said axis and parallel with the ground; means for driving the front and rear wheels in one direction; air cushion means carried by the chassis for exerting a downward force on the ground and an upward lift force on the chassis; means for lifting the said wheels off the ground and applying them in engagement with the ground without disturbing the attitude of the chassis while the vehicle is in motion, the said lifting means being so arranged that one at least of the two front and rear wheels is capable of being selectively applied in engagement with the ground independently or in combination with any one of the other two wheels.

4,190,130

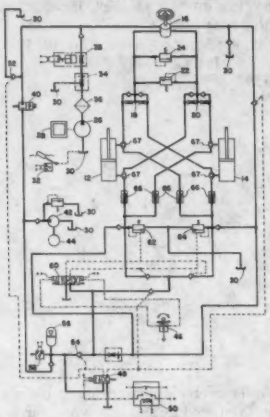
DUAL STEERING SYSTEM FOR OFF-HIGHWAY VEHICLES

Earl Beck, Springdale, Ark., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Filed Sep. 11, 1978, Ser. No. 941,023
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—133 5 Claims

1. Dual vehicular steering apparatus with a primary steering system for normal operation and a secondary system for emergency operation triggered by pressure sensitive switching and valving means wherein both systems have in a common a pair of single rod hydraulic steering cylinders, each cylinder being connected to a steerable wheel of the vehicle and being capable of steering the vehicle despite complete failure of the other steering cylinder; engine means to power said vehicle; hydraulic fluid stored in a tank; cylinder shuttle valve means for each steering cylinder to separate said primary system from said

secondary system; and means for conducting said fluid from said cylinder shuttle valve means to said steering cylinders and wherein said primary system comprises main pump means driven by said vehicle engine to maintain an acceptable level of pressure in said primary system; a high pressure filter; means for conducting fluid from said pump to said filter where said fluid is filtered; a priority flow divider to divert said fluid in excess of an acceptable pressure level; means for conducting said fluid from said filter to said priority flow divider; a control valve to regulate the flow of said fluid; means to conduct fluid from said priority flow divider to said control valve; integrated valving means to proportionately regulate fluid flow between said cylinders; means for conducting said fluid from said control valve to said proportional valve means; and means to conduct said fluid from said proportional valve package to said



cylinder shuttle valve means; and wherein said secondary system comprises secondary steering pump means; electric motor means driven by the vehicular battery to drive said secondary pump; means to conduct said fluid from said secondary pump means through said switching and valving means and to said cylinder shuttle valve means; an accumulator; pressure sensitive switching and valving means to conduct said fluid from said secondary pump to said accumulator; means to conduct said fluid from said accumulator to said cylinder shuttle valve; means to apply equal pressure to both ends of each steering cylinder thereby locking said steering cylinders in a single operating mode; means to selectively drain fluid from selected ends of said steering cylinders to effect steering; and operator controlled secondary steering switch and valve means to operate said fluid drain means.

4,190,131

NOISE ABATEMENT TECHNIQUES AND SYSTEMS

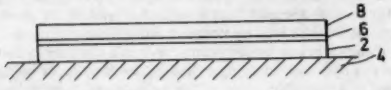
William D. Robinson, Ipswich, England, assignor to Delta Materials Research Limited, Ipswich, England

Filed Feb. 14, 1978, Ser. No. 877,729

Claims priority, application United Kingdom, Feb. 16, 1977, 6574/77

Int. Cl.[2] F16L *11/00;* **B32B** *5/14, 7/02;* **G10K** *11/02*

U.S. Cl. 181—296 **41 Claims**



1. A method of reducing the noise emanating from a noise generating source, such as a machine tool, comprising the steps of:

(a) covering a surface from or through which the noise emanates with a first flexible layer of a resilient vibration-isolating material selected from a group consisting of plastic foam, rubber foam, rubber, and fibrous material, said first layer being in contact with and supported by said surface from or through which the noise emanates;

(b) covering the first layer with an intermediate flexible layer of a heavy, limp, sound-insulating barrier material, said first layer being in contact with and supporting the intermediate layer and decoupling the intermediate layer from said surface from or through which the noise emanates; and

(c) covering the intermediate layer with an outer flexible surface-protective layer resistant to impact, wear, and abrasion;

whereby a cladding, consisting of a flexible layered structure, is formed for reducing the noise emanating from the noise generating source.

14. A cladding for reducing the noise emanating from a noise-generating source having a surface from or through which the noise emanates, said cladding consisting of a flexible layered structure adapted to cover the surface, said layered structure comprising:

(a) a first flexible layer of a resilient vibration-isolating material selected from a group consisting of plastic foam, rubber foam, rubber, and fibrous material, said first layer being adapted to be positioned in contact with and supported by said surface from or through which the noise emanates;

(b) an intermediate flexible layer of a heavy, limp, sound-insulating barrier material, said first layer being in contact with and bonded to the intermediate layer and serving to decouple the intermediate layer from said surface from or through which the noise emanates; and

(c) an outer flexible surface-protective layer resistant to impact, wear, and abrasion, bonded to a face of the intermediate layer remote from the first layer.

25. A stock tube provided with a flexible cladding comprising:

(a) a first flexible layer of a resilient vibration-isolating material selected from a group consisting of plastic foam, rubber foam, rubber, and fibrous material, and first layer being in contact with and enclosing an outer surface from or through which noise emanates out of the stock tube;

(b) an intermediate flexible layer of a heavy, limp, sound-insulating barrier material, said intermediate layer being in contact with and enclosing the first layer, said first layer decoupling the intermediate layer from the outer surface from or through which the noise emanates out of the stock tube; and

(c) an outer flexible surface-protective layer resistant to impact, wear, and abrasion, enclosing the intermediate layer.

4,190,132

SPIDER THREAD

Jean-Paul Desilets, 7952 NE. 4th Ave., Miami, Fla. 33138

Filed Jun. 7, 1976, Ser. No. 682,750

Int. Cl.[2] A62B *1/08, 35/00*

U.S. Cl. 182—6 **2 Claims**

1. A device that enables a person to make an emergency descent from outside a building or an elevated place, said device comprising a flexible longitudinal flat band (preferably steel band) one end of which must be fastened at the starting point, said flat band being wound on a reel made of two connected disks by a core having a center hole, two L-shaped plates connected at one end thereof with center holes and having a trapezoidal shape placed one on each side of said reel with friction material between said plates and said reel, said plates forming the body of the device and at the opposite end having two corners extending beyond the circumference of the

reel in order to install a roller at one of said corners and a snap hook at the other corner, said hook is adapted to be connected to a harness worn by the user, two convex disks having center holes placed one on each side of said plates, the above mentioned parts, reel, plates and disks being held together by a bolt

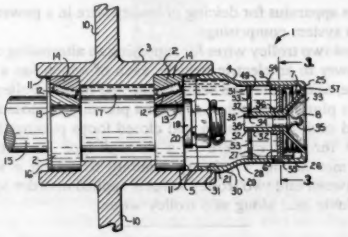
through their center holes, said bolt being used as an axle for the reel and as a means to apply a braking effect on the reel by pressing the plates against said reel when a threaded knob or handle at the threaded end of the bolt is being tightened with one hand, thus enabling the user to control the rate of his descent.

4,190,133

WHEEL BEARING PRESSURE LUBRICATOR

Kenneth C. Ploeger, 5th and Dryden, Odessa, Mo. 64076

Filed Oct. 10, 1978, Ser. No. 950,010
Int. Cl.[2] F16N *11/04*; B60B *27/00*
U.S. Cl. 184—1 D **4 Claims**



1. A wheel bearing pressure lubricator comprising:

(a) a hollow cap having a side wall, a central aperture, an open end and a closed end, said open end being adapted for sealing engagement with a wheel hub, said side wall having an interior surface with a substantially cylindrical shape;

(b) a tubular member having connection with a central portion of said closed end and extending therefrom between and concentrically with said side wall;

(c) a lubricator fitting connected with said closed end and communicating with said tubular member;

(d) a piston structure slidably and sealingly mounted on said tubular member and having a marginal edge thereof sealingly engaging the interior surface of said side wall; said marginal edge having a defined length;

(e) a spring member positioned between said piston structure and said closed end and urging said piston structure toward the open end;

(f) a vent aperture disposed through said cap at a point adjacent to said closed end;

(g) an abutment means in said cap limiting translation movement of said piston structure toward said open end and having openings for communication of wheel hub lubricant pressure to said piston structure;

(h) an overflow opening extending through said side wall in spaced relation to said abutment means and at a point whereby the pressure of lubricant in said wheel hub moves said piston structure away from the abutment means to a filled position exposing said overflow opening to prevent excess lubricant pressure in the wheel hub;

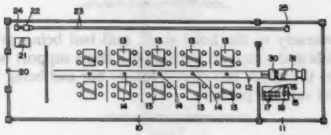
(i) a piston position indicator aperture in said side wall with a location and size relative to the length of the piston marginal edge to be closed thereby when the piston structure is translated to said hub filled position and to be open when the piston structure engages the abutment means and ceases to apply pressure to lubricant in the wheel hub.

4,190,134

DISH CARRYING SYSTEM

Noboru Kato, 1279 banchi Josuihoncho, Kodaira-shi, Tokyo, Japan

Filed Dec. 20, 1977, Ser. No. 862,608
Claims priority, application Japan, Apr. 14, 1977, 52/43291; Apr. 14, 1977, 52/43292
Int. Cl.[2] A47G *23/08*
U.S. Cl. 186—1 R **11 Claims**



1. Apparatus for carrying a product from a first area to a preselected one of a plurality of second locations, comprising:

rails laid over the distance between said first area and said plurality of second locations, said plurality of second locations being arranged along and on laterally opposite sides of said rails; and

a vehicle adapted to travel on said rails with a product loaded thereon, said vehicle including:

a body mounted on wheels which are engageable with said rails;

openings on laterally opposite sides of said body;

flaps movably mounted on said body for selectively opening and closing respective ones of said openings; and

a tray member in said body and slidable horizontally relative to said body and in interlocked relation with opening and closing actions of each of said flaps, said tray member being slidable outwardly of said body toward one of said openings when the flap corresponding to said one of said openings is opened and being slideable inwardly to its original position in said body upon closing of said corresponding flap.

4,190,135

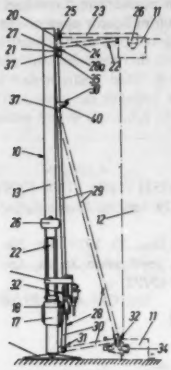
GEAR RACK HOIST

Joerg Wenzel, and Erich Mai, both of Kirschfurt, Fed. Rep. of Germany, assignors to Josef Haamann, Fed. Rep. of Germany

Filed Mar. 1, 1978, Ser. No. 882,100
Int. Cl.[2] B66B *9/00*
U.S. Cl. 187—1 R **4 Claims**

1. In a gear rack hoist for lifting, lowering and/or supporting containers, shelters, cabins, temporary construction or the like having corner fittings which operate in concert with conical actuating parts of upper and lower hoist beams mounted in spaced relation on the hoist shaft and respectively associated with upper and lower corner fittings, the beam associated with the lower fittings being provided with two bars of different lengths each articulatedly connected by means of bolts to the hoist shaft and to the conical actuating part, the total length of these two bars not appreciably or at all exceeding the height of the hoist shaft, the improvement wherein the connecting means at the hoist shaft (13) for the longer bar (29) of the lower beam (28), where said longer bar assumes an operational posi-

tion slanting upwards against the hoist shaft, comprises an outwardly closed, generally U-shaped suspension and securing bail surrounding said bar (29) with play and extending gener-



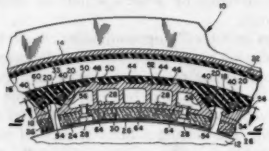
ally transversely to the hoist shaft, said bail being provided with a guide and a support pocket (44), and a support bolt (37) fastened to the upper end of said longer bar and being receivable in said support pocket.

4,190,136

COUPLING APPARATUS

Marcus H. Collins, Akron, and Kiritkumar R. Patel, North Royalton, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 13, 1978, Ser. No. 959,972
Int. Cl.² F16D *49/14*
U.S. Cl. 188—367 **24 Claims**



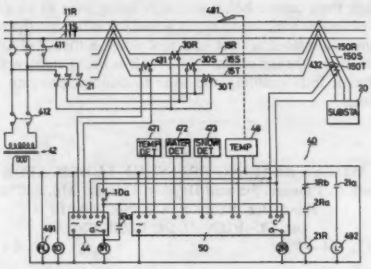
23. A coupling comprising a rim assembly, a drum assembly rotatable relative to said rim assembly about an axis of rotation, a fluid expandable tube element having an exterior surface connected to said rim assembly for rotation therewith relative to said drum assembly, said tube element including a plurality of plies and a plurality of spaced apart lugs disposed on said exterior surface, a plurality of shoe members, each of which includes a first surface and a second surface disposed substantially parallel to said first surface, each of said shoe members including means disposed on said first surface connectable with one of said lugs on said tube element to support said first surface of said shoe member contiguous to said exterior surface of said tube member, said tube having a shape factor at least as large as 3.125 per square inch of interface between said first surface of said shoe member and said exterior surface of said tube member, a plurality of friction pads, one of which is secured to said second surface of each of said shoe members, said shoe members being movable in a radial direction between a first position in which said plurality of friction pads are engaged with said drum assembly to couple said input and output members upon expansion of said tube element and a second position in which said plurality of friction pads are spaced apart from said drum assembly to permit relative rotation between said input and output members upon contraction of said tube element, a plurality of projections disposed on said first surface of each of said shoe members substantially parallel to said axis of rotation, a plurality of parallel corresponding indentations disposed on said exterior surface of said tube member having a length at least as long as the length of each of said corresponding projections, each of said indentations being adapted to receive said corresponding projection therein to provide for the transfer of torque from said shoe member, through said tube element to said rim assembly.

4,190,137

APPARATUS FOR DEICING OF TROLLEY WIRES

Akira Shimada, Ibaraki; Kouichi Watanabe, Kobe, and Katsuji Nakajima, Kashihara, all of Japan, assignors to Dainichi-Nippon Cables, Ltd. and Kawasaki Jukogyo Kabushiki Kaisha, both of Kobe, Japan

Filed Jun. 22, 1978, Ser. No. 918,168
Int. Cl.² B60M *1/34*
U.S. Cl. 191—27 **10 Claims**



1. An apparatus for deicing of trolley wire in a power transmission system comprising:

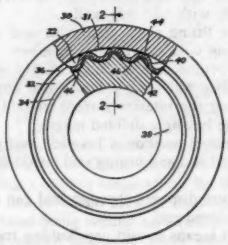
at least two trolley wires for supplying an alternating current power to an electric vehicle, each of which has a feeder line, said feeder line being connected to said trolley wires at a plurality of points to form a plurality of closed loops, and each feeder line in said closed loops passing through the through aperture of a through-type current transformer having a primary winding to which a voltage between said two trolley wires is applied in order to cause a Joule heat along said trolley wires.

4,190,138

AUTOMATIC CLUTCH

Wilfrid H. Bendall, 48-18 432rd St., Woodside, N.Y. 11377

Filed Jan. 3, 1978, Ser. No. 866,276
Int. Cl.² F16D *41/06, 41/10*
U.S. Cl. 192—43 **10 Claims**



1. An automatic clutch for connecting a driving and a driven member, said clutch comprising an externally toothed gear for connection to one of said members, a concentric annular member for connection to the other of said members, said annular

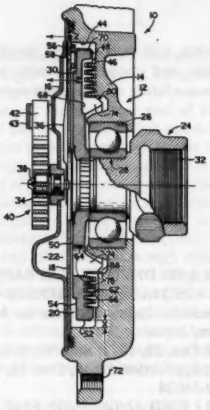
member having an internal diameter substantially larger than the external diameter of the gear to provide a radial clearance space therebetween, a corrugated resilient element having internal and external portions fitted in said space and in sprung retention on the gear with internal corrugation portions initially in centered contact with the root portions of the gear teeth alternating with external corrugation portions in contact with the internal periphery of the annular member.

4,190,139

CENTERING ABUTMENT FOR VISCOUS FLUID DRIVE

Thomas H. Tinholt, Marshall, and Phillip E. Konkle, Albion, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 5, 1978, Ser. No. 912,283
Int. Cl.[2] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **12 Claims**



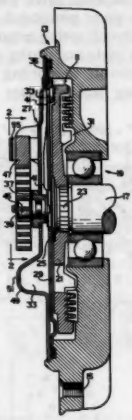
1. In a viscous fluid drive having a housing with an annular generally radially extending side member adapted to be rotated about an axis, a centrally located input shaft opening defined in said side member, a working chamber in said housing defined in part by an annular peripheral surface on said housing and an annular generally radially extending surface on said side member, a clutch member located within said working chamber and defined in part by an annular peripheral surface spaced radially from said peripheral surface on said housing by a distance of X units and an annular generally radially extending surface axially spaced from said radially extending surface on said side member, and a plurality of spaced interdigitated generally axially extending lands and grooves defined on said generally radially extending surfaces of said members intermediate said input shaft opening and said peripheral surface on said clutch member, the improvement comprising: a generally axially extending annular trough in one of said members on the radially extending surface of said one member defined in part by a generally cylindrically shaped surface, the axial depth of said trough being greater than the axial depth of said grooves on said one member; and a centering abutment located on said generally radially extending surface of said other member and being defined in part by a generally cylindrically shaped surface having an axial length of B units which is greater than the axial length of A units of said lands on said other member and radially spaced from said generally cylindrically shaped surface on said one member by a distance of Y units which is substantially less than said distance of X units to readily locate said clutch member relative to said side member for interdigitation of said lands and grooves.

4,190,140

FLUID COUPLING DEVICE, BIMETAL CLIP AND METHOD OF ASSEMBLY THEREFOR

Phillip E. Konkle, Albion, and Thomas H. Tinholt, Marshall, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 26, 1978, Ser. No. 909,755
Int. Cl.[2] F16D *43/25, 35/00*
U.S. Cl. 192—82 T **8 Claims**



1. In a fluid coupling device of the type including a first rotatable member defining an axis of rotation, cover means associated with the first member to define a fluid chamber therebetween, a valve plate disposed to separate the fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable member disposed in the fluid operating chamber and rotatable relative to the first member, valve means operable to control fluid communication between the operating chamber and the reservoir chamber and including a valve shaft disposed generally axially and extending outwardly through the cover means and being rotatable relative thereto, a bimetal element having a first end portion operatively connected to the valve shaft and a second end portion, the improvement comprising:

(a) a clip member including a portion receiving the second end portion of the bimetal element and first and second wing portions oppositely disposed about said receiving portion and oriented generally parallel to the adjacent surface portion of the cover means;

(b) means for attaching each of said first and second wing portions to said adjacent portion of the cover means;

(c) said receiving portion of the clip member being configured to substantially prevent circumferential movement of said second end portion relative to the axis of rotation; and

(d) one of said clip member and the second end portion of the bimetal coil including means for restraining radial movement of the second end portion of the bimetal coil relative to said clip member.

4,190,141

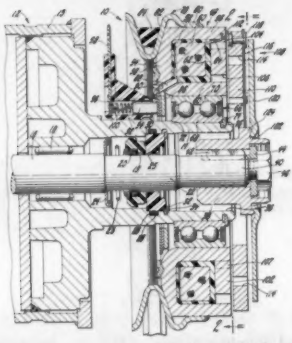
ELECTROMAGNETIC CLUTCH

George T. Bennett, Kettering, and Byron L. Brucken, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 5, 1978, Ser. No. 912,427
Int. Cl.[2] F16D *27/10*
U.S. Cl. 192—84 C **2 Claims**

1. For use with an air-conditioning compressor including a casing having a fixed tubular extension extending from an end surface thereof and a drive shaft extending centrally through

said tubular extension, with a drive hub secured to said drive shaft, an electromagnetic clutch comprising a rotatable coil housing having inner and outer walls, an energizable electromagnetic coil mounted in said coil housing, a bearing mounted around said tubular extension adjacent said inner wall for rotatably supporting said coil housing, a slip ring secured to said coil housing, a lead connected between said slip ring and said coil, a brush holder secured to said tubular extension, a spring-loaded brush mounted in said brush holder for sliding engagement with said slip ring, drive means secured to said drive hub, an armature plate positioned adjacent said drive means on the coil side thereof, spring means secured at one end thereof to said armature plate and at the other end thereof to said drive means for movably supporting said armature plate and driveably connecting said armature plate to said drive



means, driven means on said coil housing, a clutch rotor secured to the end of said inner wall of said coil housing adjacent said armature plate and extending radially outwardly from said inner wall so as to provide a radially outer uninterrupted annular gap with respect to the adjacent inner surface of said outer wall of said coil housing, first slot means formed with spaced bridging in a radially inner portion of said clutch rotor providing an interrupted inner annular gap adjacent said inner wall, and second slot means formed with spaced bridging in said armature plate providing an interrupted annular gap intermediate said uninterrupted annular gap and said inner annular gap, the arrangement providing a magnetic flux path having the characteristic that no shorting can occur across said uninterrupted outer annular gap so that said armature plate is attracted more quickly with stronger magnetic force when said electromagnetic coil is energized.

4,190,142

TORSION-DAMPING ASSEMBLIES WITH TWO-PART HUBS E.G. FOR FRICTION CLUTCHES

Jacques Berlioux, Sucy-en-Brie, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

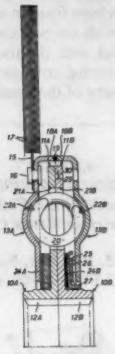
Filed Feb. 23, 1978, Ser. No. 880,578

Claims priority, application France, Feb. 25, 1977, 77 05529

Int. Cl.[2] F16D *3/14*

U.S. Cl. 192—106.2 **15 Claims**

1. A torsion damping assembly comprising two coaxial members rotatably mounted relative to each other, and circumferentially disposed resilient means interposed between said members, a first of said members comprising two one-piece hub parts, each hub part being formed of one integral piece of metal with each hub part comprising an annular radially extending elemental web and a cylindrical inner flange integrally joined to said elemental web, said cylindrical flange having integrally formed on the inside surface thereof spline means for coupling said hub part to an axial shaft, said elemental webs having openings or cutouts facing one another, opposed edges of said elemental webs defining in part said openings or cutouts serving as bearing surfaces for said resilient means; a second of said members comprising at least one annular plate member disposed annularly around said hub parts



parallel to said webs, said annular plate member having recesses formed therein and cooperating with said openings or cutouts for accommodating said resilient means.

4,190,143

METHOD AND DEVICES FOR SAFETY FOR MECHANICAL PRESSES

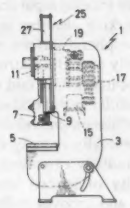
Naoki Orita, Machida, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Dec. 28, 1977, Ser. No. 865,191

Claims priority, application Japan, Dec. 28, 1976, 51-157441; Mar. 29, 1977, 52-34024

Int. Cl.[2] F16D *21/08, 67/02;* F16P *3/00*

U.S. Cl. 192—145 **8 Claims**



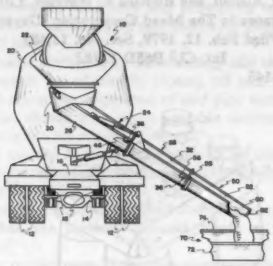
1. A mechanical press comprising a press ram mounted on a crank shaft adapted for reciprocatory movement along a vertical path between uppermost and lowermost points on said path, motor means operatively coupled to said crank shaft for turning said crank shaft through 360° rotation including an upper dead center position, main clutch and brake means for disconnecting said crank shaft from said motor means and stopping said ram at said uppermost point after completion of a stroking cycle when said crank shaft is at said upper dead center position, auxiliary clutch means operatively connected in series with said main clutch means and which is normally engaged for transmitting power from said motor means to said crank shaft, and means for automatically disengaging said auxiliary clutch means if said crank shaft unintentionally rotates past said upper dead center position upon completion of a stroking cycle of said ram.

4,190,144

CONCRETE DISCHARGE CHUTES

Evart K. Lybbert, 79 Laurel St., Salt Lake City, Utah 84103

Filed Jun. 9, 1978, Ser. No. 913,986
Int. Cl.[2] B65G *11/00*
U.S. Cl. 193—10 8 Claims



1. A concrete discharge chute section comprising:

a substantially rigid trough having an open top defined by spaced top edges;

connector means at the proximal end of the chute section sized, shaped and located to match and releasably connect to chute means of a concrete ready mix truck;

generally U-shaped substantially rigid discharge means at the distal end of the chute section comprising distal trough means to accommodate, during use, displacement of concrete along a path having a substantial horizontal component and a substantial vertical component and a discharge edge at the end of the distal trough means causing concrete leaving the chute section to fall generally vertically as a stream over said discharge edge in substantial alignment with a concrete form independent of the orientation of the truck in relation to the concrete form, the longitudinal axis of the chute section being at an angle other then 90 degrees to the form when viewed in plan from above the truck.

4,190,145

CIGARETTE DISPENSING APPARATUS

Dana C. Paret, East Shore Dr., Silver Lake, N.H. 03875

Filed Sep. 22, 1978, Ser. No. 944,789
Int. Cl.[2] G07F *11/04*
U.S. Cl. 194—1 P 9 Claims

1. Vending apparatus for dispensing cylindrical items one at a time comprising:

an elongated storage magazine for storing a plurality of cylindrical items to be dispensed and having an inlet opening for receiving the items and an outlet opening below the inlet for discharging the items;

a generally L-shaped dispensing gate rotatably mounted to the storage magazine across the outlet opening thereof and shiftable from a first blocking position in which the cylindrical items are retained in the storage magazine to a second dispensing position in which a single item is allowed to drop through the outlet opening; and

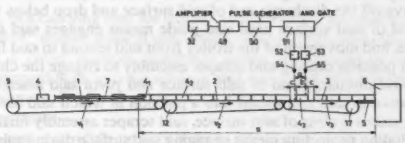
a balance beam rotatably mounted to the storage magazine and having a counterweight attached to one end and a generally u-shaped coin receptacle at the opposite end open on a top side for receiving a coin and on an end side for allowing a coin to roll out of the receptacle with said balance beam coupled through a linkage to the dispensing gate such that the counterweight normally positions the balance beam for maintaining the gate in a blocking position but deposit of a coin into the coin receptacle tilts the balance beam and shifts the dispensing gate to the discharge position.

4,190,146

APPARATUS FOR CONVEYING FRAGILE ITEMS

Max Knuchel, Gächlingen, Switzerland, assignor to SIG-Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jul. 6, 1978, Ser. No. 922,302
Claims priority, application Switzerland, Jul. 13, 1977, 8690/77
Int. Cl.[2] B65G *47/31*
U.S. Cl. 198—460 10 Claims



7. Apparatus for reducing the accumulation pressure between succeeding items being conveyed in succession along an accumulation path to a receiving device, comprising: first and second transport means disposed in succession in a conveying path, and constituting the accumulation path; means connected to control the advance of items along the accumulation path in a manner to produce gaps between successive items in the conveying direction along the accumulation path; and sensing means disposed for monitoring the length of each gap and connected to said control means for causing the rate of supply of items to the outlet end of the accumulation path to be higher than the rate at which items are being conveyed from the accumulation path to the receiving device for a selected time period following each occurrence of a gap length exceeding a selected value, and to be lower than the rate at which items are being conveyed from the accumulation path to the receiving device at all other times, whereby a cyclic variation in gap length is produced between successive gaps; and wherein said first transporting means is connected to be controlled by said control means to advance at a first speed during each selected time period and at a second speed lower than the first speed at all other times, and said second transporting means is disposed downstream of said first transporting means and is driven to advance at a speed proportional to, but higher than, the current advance speed of said first transporting means.

4,190,147

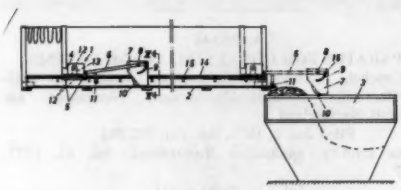
DEVICE FOR TRANSPORT OF BULK MATERIAL OR THE LIKE

Hans M. Hansson, Mölneby, Basgärden, Överlida, Sweden (510 60)

Filed Aug. 15, 1977, Ser. No. 824,820
Int. Cl.[2] B65G *25/10*
U.S. Cl. 198—746 2 Claims

1. A transfer device for moving bulk material along a path to a collecting receptacle comprising an elongated chute having a surface defining said path, said surface including an inner end

and a material discharge end, a trolley mounted for longitudinal reciprocating movement along said chute, elongated arm means pivoted to said trolley and extending longitudinally of said chute, a scraper assembly including scraping means pivoted to said arm means at a distance from said trolley, guide means depending from said arm means for engagement with said surface and drive means for moving said trolley along said chute between a first end position adjacent said inner end of said surface in which first position said scraping means engages said surface and said guide means is clear of said surface and a second end position in which said guide means engages said surface adjacent said discharge end and said scraping means projects beyond said discharge end below the level of said surface, movement of said trolley from said first to said second



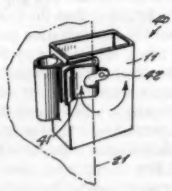
end position causing the scraping means to scrape said surface, move off the discharge end of said surface and drop below the level of said surface until said guide means engages said surface, and movement of the trolley from said second to said first end position causing said scraper assembly to engage the chute at said discharge end of said surface and pivot said assembly relative to said arm means into a position in which said scraping means is clear of said surface, said scraper assembly further including projecting means engaging said surface during subsequent return movement of the trolley to said first end position for retaining the scraping means clear of said surface wherein said trolley includes guide wheels with peripheral grooves and said chute includes track means having upper and lower sections received in said grooves.

4,190,148

CIGARETTE AND CIGARETTE LIGHTER CASE AND COVER

Palmer W. Schade, II, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Oct. 19, 1976, Ser. No. 733,846
Int. Cl.[2] A24F *15/00*; B65D *85/10*; A45C *15/00, 1/04*
U.S. Cl. 206—89 **2 Claims**



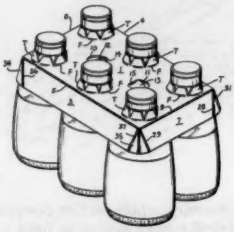
1. A cigarette and cigarette lighter case assembly, comprising a case with an open end and a removable cover, said case having a cavity for receiving a pack of cigarettes and a separable cavity for receiving a cigarette lighter, said cover being adapted to fit over said open end and close simultaneously said openings to both said cavities, in combination with a two pronged U-shaped clip pivotally secured to a rear side of said case by pivot means whereby both said pivot and said clip are spaced from said open end and rear side respectively to permit closure of said case by said cover, said clip being pivotable to a position whereby the cigarette pack and lighter will be vertical when said case is mounted on a vertical edge of users garment with both said prongs engaging said garment, said clip being aligned parallel to a plane passing through the centers of said cavities.

4,190,149

ARTICLE CARRIER AND BLANK THEREFOR

James R. Oliff, Austell, and Richard K. Watkins, Lithonia, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 12, 1979, Ser. No. 11,481
Int. Cl.[2] B65D *85/62*
U.S. Cl. 206—145 **6 Claims**



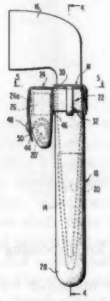
1. A top gripping article carrier blank comprising a top wall **(1)**, a pair of side walls **(2,3)** foldably joined respectively to the side edges of said top wall, a pair of end walls **(6,7)** foldably joined respectively to the end edges of said top wall, multiple neck receiving apertures **(16–21)** formed in said top wall, and characterized by a web panel **(22,23,26,27)** foldably joined to each end edge of each wall of one pair of walls along a fold line disposed at an acute angle to the fold line between the associated wall and said top wall, an anchoring tab **(30,31,34,35)** joined to each end edge of each wall of the other pair of walls along a fold line disposed at an acute angle to the fold line between the associated wall and said top wall, the outer edge of each of said anchoring tabs disposed at an obtuse angle with respect to the fold line between the associated wall of said other pair of walls and said top wall, and said anchoring tabs being spaced respectively from the associated web panel.

4,190,150

SANITARY PROTECTIVE SHEATH WITH DISPOSABLE ABSORBENT LINER FOR TOBACCO PIPE STEM

Raymond J. Bresell, 18 Moody Ave., Claremont, N.H. 03743

Filed Nov. 8, 1978, Ser. No. 958,914
Int. Cl.[2] A24F *3/00, 9/00*; B65D *65/02*
U.S. Cl. 206—244 **6 Claims**



1. A sanitary protective sheath assembly for sheathing a smoking pipe stem, cigarette or cigar holder mouthpiece or the like, said sheath assembly comprising:

an elongated tubular sheath, said sheath being closed at one

end and open at the other to form a mouth for reception of the pipe stem,

a tubular absorbent material being transversely sized to fit within said sheath, being closed at one end and open at the other end and insertably carried within the closed end of said sheath,

means carried by said liner and projecting upwardly from said liner to the mouth of said sheath for effecting retrieval of said liner,

an adjustable closure strap surrounding said sheath adjacent said mouth for adjustably closing off said sheath at said mouth about the upper end of said pipe stem to frictional lock the sheath to a given variable diameter pipe stem, cigarette holder mouthpiece, etc,

a pouch carried by said strap exterior of said sheath, said pouch including a lockable cover permitting access to the pouch interior, and

said assembly including a cylindrical plug having a diameter less than the diameter of said sheath at the open end thereof;

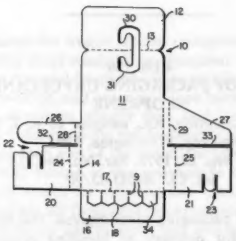
whereby replacement of the pipe stem with the plug permits the strap to close off the upper end of said sheath about said plug and to prevent contamination of the sheath interior or the disposable lining when the sheath is not employed in sheathing the pipe stem or the like.

4,190,151

DISPLAY HANGER

Frederick S. Russell, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,181
Int. Cl.² B65D *85/18*
U.S. Cl. 206—281 **1 Claim**



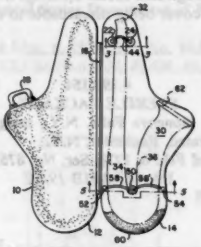
1. A display hanger for garments or the like formed from a single blank of relatively stiff material such as paperboard comprising, a main body panel having front and rear surfaces, said front surface being adapted to have printing matter applied thereon, a reinforcing flap foldably attached to the upper end of said main body panel and adhered to the unprinted rear surface thereof so that cut outs formed in both said reinforcing flap and main body panel coincide to form a means for suspending the hanger from a companion support member, a first pair of interlocking flaps foldably attached to the side edges of said main body panel for retaining one or more garments on said hanger, and a second pair of flaps foldably attached to the side edges of said main body panel for supporting the garments displayed, the improvement comprising an extension flap attached to the lower end of said main body panel that is normally folded out of view and adhered to the rear surface of said main body panel, said extension flap further comprising a plurality of separate tab elements that are printed with indicia to indicate incremental pricing information for the garments so displayed and that are adapted to be selectively folded into view, said tab elements being of substantially the same width and length but having an overall length that is less than the length of said extension flap so that the end of said extension flap remote from said tab elements can be adhered to the unprinted rear surface of said main body panel, said tab elements being separated from one another and from the extension flap by perforated lines so that when price changes occur, the previously exposed price tab elements may be removed and others folded into view.

4,190,152

MUSICAL INSTRUMENT CARRYING CASE

Richard L. Reiter, 36 Catherine Ct., Cedar Grove, N.J. 07009

Filed Feb. 27, 1979, Ser. No. 15,846
Int. Cl.² A45C *11/00*
U.S. Cl. 206—314 **9 Claims**



1. In a carrying case for storing and carrying a saxophone or similarly shaped musical instrument, said case including a floor and a cover portion; improved means for preventing said instrument from moving while in said case and for holding said instrument firmly in engagement with the floor of said case comprising:

a post extending upwardly from the floor of said case and located in the crook of said saxophone between the main body and the bell thereof;

resilient means secured to said post and to said floor and extending over said main body and holding the same firmly to the floor preventing movement thereof; and

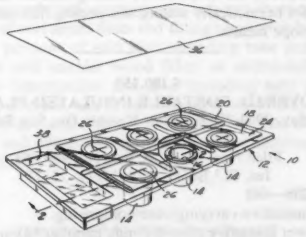
further resilient means secured to said post and to said floor and extending over said bell and holding the same firmly to the floor preventing movement thereof.

4,190,153

SPONGE DISPOSAL TRAY

C. Eric Olsen, Ventura, Calif., assignor to California Medical Developments, Inc., Ventura, Calif.

Filed Oct. 23, 1978, Ser. No. 953,697
Int. Cl.² B65D *1/36, 81/36*
U.S. Cl. 206—362 **4 Claims**



1. A medicinal sponge disposal tray comprising:

a transparent frame;

a plurality of initially empty containers, each said container being integral with said frame, each said container having an open upper end;

a thin sheet material transparent access cover located over each of said open upper ends and fixedly secured to said

frame, said access cover including a plurality of slitted access openings with there being a single access opening connecting with each said open upper end of a said container, each said access opening being normally closed to enclose said empty container but being openable to permit insertion and deposit of a sponge into a said container and being automatically reclosable thereafter, entry into each container being only through its respective said slitted access opening; and

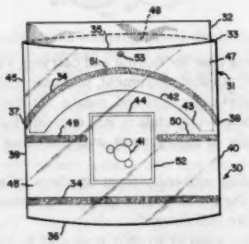
a thin sheet material sealing cover covering said access cover, said sealing cover preventing entry of foreign material through said access openings into said containers, said sealing cover being discardable to expose said access cover.

4,190,154

STERILE PACKAGE

James A. Clark, Honeoye Falls, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,063
Int. Cl.[2] A61B *19/02*
U.S. Cl. 206—438 **16 Claims**



1. An improved sterilizable, sterility maintaining, peelable package for sterile products which comprises:

envelope means;

peeling film means inserted in and extending from one end of said envelope means for opening a portion of said package and removal of said sterile product without contamination;

said peeling film means extending for only a portion of the length of said envelope means in order to facilitate the opening of said envelope means while at the same time minimizing the quantity of material required;

said peeling film means comprising an untreated sheet of sterilizable plastic film having a density appreciably dissimilar from the density of said envelope means; and

closure means for hermetically sealing said envelope means and for hermetically sealing said peeling film means to said envelope means.

4,190,155

COVERED, PORTABLE INSULATED PLATE

Faith Higley, 2003-29 Bay View Heights Dr., San Diego, Calif. 92105

Filed Nov. 13, 1978, Ser. No. 959,763
Int. Cl.[2] B65D *1/24, 25/14, 25/28*
U.S. Cl. 206—445 **1 Claim**

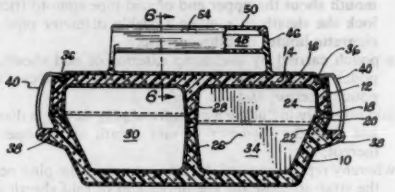
1. An insulative carrying case comprising:

(a) a lower insulative plate-defining member having impervious inner and outer wall surfaces with an insulation material therebetween, said member defining a first continuous peripheral edge and a first continuous vertical partition compartmentalizing said lower member;

(b) an insulative upper cover member having a second continuous edge metable with said first edge and a second continuous vertical partition matable with the first partition; said upper cover member having impervious inner and outer wall surfaces with an insulation material therebetween;

(c) fastening means to releasibly fasten said upper and lower members together in compressed relation with the edges and partitions sealingly mated to define a plurality of generally horizontally aligned and extended, sealed and mutually separate compartments;

(d) a carrying handle comprising a horizontally extended bar defining a hollow interior cavity having a hinged integral



cover lid for the containment of utensils and food condiments, said handle being supported by leg members integrally, unitarily connected to said bar and integrally, unitarily connected to the outer wall surface of said upper member substantially above the combined centers of gravity of said upper and lower member whereby a typical multi-course meal may be transported and stored for a number of hours while maintaining substantial temperature integrity and spacial fidelity to a conventionally served meal.

4,190,156

METHOD OF PACKAGING UNVULCANIZED NEOPRENE

Alain C. Adam, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 28, 1978, Ser. No. 946,713
Int. Cl.[2] B65D *85/70*
U.S. Cl. 206—447 **6 Claims**

1. A method of packaging unvulcanized, talc-treated, solid neoprene pieces for delivery to blending equipment, said method comprising placing the neoprene pieces in a bag made of a thermoplastic material and closing the bag by stitching with a synthetic polymer thread, the polymeric materials of which the bag and the thread are made being readily dispersible in the neoprene at the blending temperature to give a homogeneous dispersion at the weight levels at which they are used, the plastic bag having on a portion of one of its large surfaces a coating of a hot melt adhesive.

4,190,157

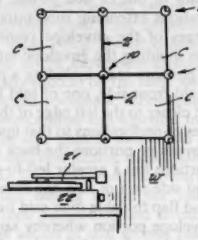
PHONOGRAPH COVER HOLDER (COVER-UP)

Mark S. Chatham, P.O. Box 14153, Milwaukee, Wis. 53214

Filed Nov. 6, 1978, Ser. No. 958,047
Int. Cl.[2] A47G *1/16*
U.S. Cl. 206—477 **3 Claims**

1. A phonograph record cover holder, comprising, in combination, a base and a disc molded of rigid plastic; said base comprising a circular member having a hole therethrough and pressure-sensitive adhesive on its rear side, and a rib means on its front side, said disc comprising a circular member having a rearward stem at the center of its rear side, said stem rotatably fitting in said hole through the center of said base, a rear side of said disc abutting against said rib means, said rib means

forming spaces between said base and disc, for receiving phonograph cover corners, and said disc having a one-quarter notch on its periphery for said cover corner to pass therethrough.

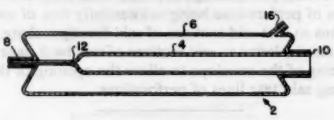


4,190,158

CONTAINER FOR DELICATE ARTICLES

Charles J. Ambrose, 2230 Benton St, Richland, Wash. 99352

Filed Sep. 15, 1975, Ser. No. 613,402
Int. Cl.² B65D *85/30, 81/02*
U.S. Cl. 206—522 **8 Claims**



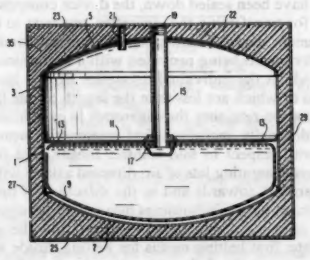
1. A container for fragile articles comprising an outer envelope of flexible sheet material, an elongated inner envelope of flexible sheet material for receiving an article, extending across said outer envelope, said outer envelope having normal dimensions in all directions greater than said inner envelope, the walls of said outer envelope being sealed to said inner envelope only adjacent each end of the latter, the interior of said inner envelope being vented to the atmosphere outside said outer envelope, and means for inflating said entire outer envelope, thereby expelling air from said inner envelope and collapsing said inner envelope tightly about said article, said outer envelope being empty except for said inner envelope.

4,190,159

ENCAPSULATED UNDERGROUND LIQUID STORAGE TANK

Jerry L. Hoyt, Rogers, Ark., assignor to Mark Controls Corporation, Evanston, Ill.

Filed Nov. 6, 1978, Ser. No. 957,819
Int. Cl.² B65D *25/18, 81/02*
U.S. Cl. 206—524 **4 Claims**



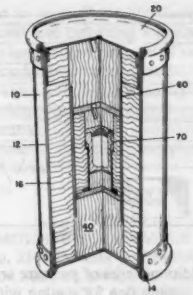
1. A liquid storage tank in a carton, the tank being spaced from the side walls of the carton on all sides, hardened plastic foam filling the space between the exterior of the tank and the interior of the carton, and at least one pipe fitting communicating with the interior of the tank and extending beyond the tank through the foam and endwise abutting the inner side of at least one wall of the carton.

4,190,160

ACCIDENT RESISTANT TRANSPORT CONTAINER

John A. Andersen, and James K. Cole, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1979, Ser. No. 18,098
Int. Cl.² B65D *81/04, 81/06, 85/30*
U.S. Cl. 206—591 **5 Claims**



1. An accident resistant container for shipping materials such as plutonium comprising a tubular steel housing, a metal load spreading tube of shorter length than said housing concentrically disposed within the housing and spaced therefrom having upper and lower end portions inset with respect to corresponding end portions of said housing, a first metal disk inset with respect to the lower end of said tube to provide a projecting skirt portion and secured to the tube forming a bottom support, a metal heat conductor member within said load spreading tube and spaced therefrom with a lower end portion secured to said first disk and projecting upwardly therefrom having an open upper end terminating within said metal tube for positioning and retaining therein a vessel with material such as plutonium therein, a second metal disk inset with respect to the upper end of said tube forming a tube closure and providing a projecting skirt portion, an annular wood filler intermediate said housing and load spreading tube, lower and upper wood fillers having end portions projecting into and abutting against respective of said metal disks and filling respective lower and upper end portions of said load spreading tube and central portions of said annular wood filler, an additional annular wood filler intermediate said load spreading tube and heat conducting member, and lower and upper wood fillers having end portions abutting respective of said metal disks to position said vessel and filling central portions of said additional annular wood filler.

4,190,161

COMPARTMENTED ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

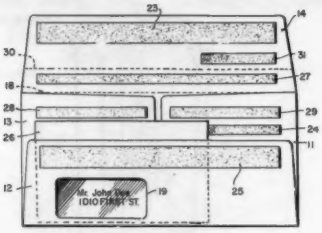
Continuation-in-part of Ser. No. 868,875, Jan. 12, 1978, abandoned. This application Nov. 29, 1978, Ser. No. 964,709
Int. Cl.² B65D *27/34, 27/04, 27/08, 27/16*
U.S. Cl. 206—620 **4 Claims**

1. A compartmented envelope formed from a single blank of envelope material and including at least one integral panel for

dividing the envelope into compartments consisting of a window compartment that is smaller in length and width than the exterior dimensions of the envelope and a second full sized compartment in front-to-back relation comprising, an elongated rear panel having two long edges and two shorter edges, a front window panel foldably attached to one of the long edges of said rear panel, a sealing flap foldably attached to the other long edge of said rear panel and a first end closue flap foldably attached to one of the shorter edges of said rear panel, the improvement comprising:

(a) a second end closure flap foldably attached to the opposed shorter edge of said rear panel, said second end closure flap being of a length sufficient to divide the envelope into its two compartments but not long enough to overlap the opposite end closure flap;

(b) a first area of pressure sensitive adhesive applied to said front panel;



(c) at least one additional area of pressure sensitive adhesive applied to said sealing flap for mating with said first area to seal both compartments

(d) separate adhesive areas applied to said sealing flap and to said second end closure flap which, when mated together, additionally seal the only compartment full-sized;

(e) a perforated line in said sealing flap between the adhesive areas applied thereto for permitting independent access to said window compartment; and,

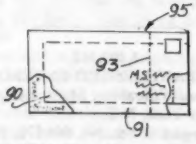
(f) a third area of pressure sensitive adhesive applied to said second end closure flap, all of said pressure sensitive adhesive being of the type that will only adhere to itself whereby when said sealing flap is folded to close the envelope, the third area of adhesive mates with an area of adhesive on said sealing flap flap to retain an item that is smaller in length than said envelope in position in the window compartment of said envelope.

4,190,162

STATIONERY HAVING SNAP-OPEN ENVELOPE WITH REMAILABLE PORTION

Eugene J. Buescher, St. Charles County, Mo., assignor to William R. O'Meara, Florissant, Mo.

Continuation of Ser. No. 480,621, Jun. 19, 1974, abandoned.
This application Jan. 26, 1978, Ser. No. 872,467
Int. Cl.[2] B65D 27/06
U.S. Cl. 206—625 **14 Claims**



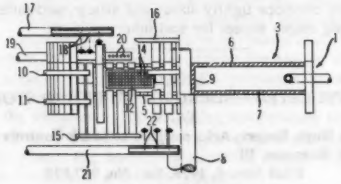
1. A mailing envelope capable of containing an element to be mailed comprising front and back sides connected in facing relation, and upper, lower, left and right edges when viewing said front side, said front and back sides including front and back panels, respectively, mailing address means on the exterior of said front panel for mailing the envelope, return address means on the exterior of one of said panels, first and second tear lines of perforations extending substantially between the upper and lower eges of the envelope respectively on said front and back sides dividing the envelope into separable left and right envelope portions each including a part of said back side and a part of said front side, one of said lines of perforations being disposed closer to the left edge of the envelope than the other of said lines of perforations so that upon separation of said left and right envelope portions the back side part of one of said envelope portions has a greater left-to-right dimension than that of the front side part of said one envelope portion to provide a closure end flap foldable over said front side part for closing said one envelope portion whereby said one envelope portion is usable to mail an element therein, said left and right envelope portions remaining together when the envelope is mailed, said one envelope portion includes said return address means for mailing said one envelope portion, said mailing address means and said lines of perforations being so relativey disposed on the envelope that said closure end flap is capable of covering at least a portion of said mailing address means when folded over said front side part of said one envelope portion to close said one envelope portion, said front and back panels being discrete sheets secured together by adhesive means between facing marginal portions of said panels but with sections of said facing marginal portions laterally between said tear lines of perforations being substantially free of said adhesive means so that said sections of said front panel are capable of movement relative to said sections of said back panel during the opening of the envelope to allow the opening of the envelope along said tear lines of perforations.

4,190,163

DEVICE FOR CHECKING THAT THE BANDS JOINING FILTERS TO CIGARETTES HAVE BEEN SEALED DOWN

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Jun. 27, 1978, Ser. No. 919,691
Claims priority, application Italy, Sep. 26, 1977, 3558 A/77
Int. Cl.[2] B07C 5/00
U.S. Cl. 209—535 **8 Claims**



1. A device for checking that the bands joining filters to cigarettes have been sealed down, the device comprising transfer means for transferring the cigarettes, one next to the other, in a movement direction crosswise to their longitudinal axes, said transfer means being provided with a succession of housings into which the individual cigarettes fit, the longitudinal dimensions of which are less than the length of one filter cigarette, means for retaining the cigarettes in said housings, the device additionally including first pneumatic means placed laterally with respect to said transfer means, said first pneumatic means generating jets of air, directed axially with respect to the cigarettes, towards and in the direction of openings in axial alignment with said housings into which the cigarettes fit, the width of which being slightly greater than the section of one cigarette; first halting means for halting, inside said housings, the movement of the cigarettes passing through said openings with just that part around which the cigarette-filter

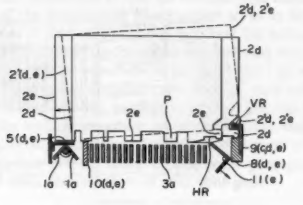
jointing band has been placed, under the action of the said first pneumatic means, said first halting means being placed laterally with respect to said transfer means, on the opposite side thereof to where said first pneumatic means are positioned; cigarette interception and ejecting means for intercepting and ejecting the cigarettes from their respective housings in the transfer means, these being placed downstream of said first pneumatic means in the movement direction of said transfer means and laterally thereto on the same side as said first pneumatic means; second pneumatic means placed downstream of said cigarette interception and ejection means, in the movement direction of said transfer means and laterally thereto on the same side as said first halting means, said second pneumatic means generating jets of air directed towards and axially to the cigarettes; second halting means for halting the cigarettes moving inside their respective said housings in said transfer means under the action of said second pneumatic means, said second halting means being placed laterally with respect to said transfer means, on the side thereof where said first pneumatic means and said interception and ejection means are located downstream of the latter with respect to the movement direction of said transfer means.

4,190,164

RANDOM AUTOMATIC SELECTOR

Chiaki Matsuda, Tokyo, Japan, assignor to Mazda Cartex Company, Limited, Tokyo, Japan

Filed Jan. 25, 1978, Ser. No. 872,117
Int. Cl.[2] B07C 3/20
U.S. Cl. 209—610 **5 Claims**



1. A random automatic selector comprising a plurality of code bars which are aligned in parallel and selectively descend corresponding to a designated code number; a plurality of file cases each having projections at the bottom corresponding to its own predetermined code number and further having a vertical separation recess at the rear edge and a horizontal separation recess also at the bottom edge; an elongated spiral rotor for sequentially lifting and dropping the file cases to drop a designated file cases away from the other file cases; means for engaging the vertical recess for separating the designated file case at the rear edge; means for holding a front edge of the designated file case; and means for engaging the horizontal recess for horizontally pushing out only the designated file case.

4,190,165

PIPE CHOCK STICK

Edward H. Collins, Medford, Oreg., assignor to The Mt. Pitt Company, Medford, Oreg.

Filed Dec. 27, 1977, Ser. No. 864,216
Int. Cl.[2] B65G 1/14
U.S. Cl. 211—60 R **2 Claims**

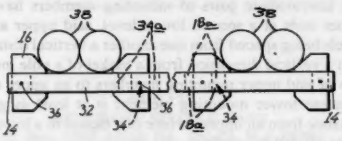
1. A pipe chock stick used in bracing pipes or the like comprising

an elongate board having a pair of opposed end regions and a pair of spaced-apart, substantially parallel faces,

brace means securable to one of said end regions for bracing pipes stacked against said faces,

means defining, intermediate said end regions, a longitudinally extending slot communicating with said faces,

a block having a pair of opposed arms, portions of which define opposed, longitudinally extending edges of a gullet formed centrally in said block, said block being dimensioned to be received within said slot, by insertion of one of said arms therethrough, wherein said arms extend beyond associated ones of said faces, and said gullet being



dimensioned to receive slidably therein, portions of said board adjacent and extending longitudinally of said slot, wherein the longitudinal position of said block within said slot may be selectively varied, and

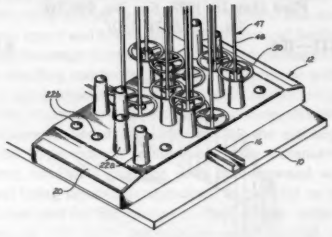
means for securing said block in said slot at a selected longitudinal position, wherein said block and said brace means, when the latter is secured to said board, are spaced apart a selected distance for bracing therebetween pipes stacked against said faces.

4,190,166

SKI POLE MOUNTING ASSEMBLY AND METHOD

James D. Allsop, 2144 Dellesta Dr., Bellingham, Wash. 98225

Filed Mar. 17, 1978, Ser. No. 887,806
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—60 R **39 Claims**



1. A mounting assembly for pairs of ski poles, each of which has a main pole portion, a basket at the lower end of the pole portion, and a tip portion extending downwardly from the basket, the baskets of each pole having a predetermined radius and diameter, and the tip portions each having a predetermined length, said display assembly comprising:

a. a base member having a longitudinal axis,

b. a plurality of platform members mounted to said base for limited movement thereon along said longitudinal axis, each platform member having its own longitudinal axis parallel to the base member longitudinal axis, and a lateral axis generally transverse to its longitudinal axis,

c. each platform having thereon pairs of mounting members, each of which has an upper end with an upwardly facing mounting socket of a predetermined depth dimension to receive therein a tip portion of a pole, the pairs of mounting members being arranged in first and second transverse rows, each row being made up of alternate pairs of mounting members and intermediate pairs of mounting members positioned intermittently with the alternate pairs of that row, the alternate pairs of mounting members of the first row being arranged in a staggered relationship with the alternate pairs

of the first row being in staggered relationship with the intermediate pairs of the second row,

d. said mounting members being arranged in generally longitudinal and transverse alignment, each of said mounting members being spaced from adjacent aligned mounting members by a distance greater than the radius of the baskets and less than the diameter of the baskets,

e. the alternate pairs of mounting members having their upper ends at a first upper level above their related platform, and the intermediate pairs of mounting members having their upper ends at a second lower level, said upper and lower levels being spaced from one another a vertical distance such that a vertical dimension from a basket of a pole mounted in one of said upper mounting members to an upper end of an adjacent lower mounting member is at least as great as a distance from an upper surface of a basket to a lower tip end of its related tip portion,

whereby ski poles in aligned adjacent mounting members have their baskets in overlapping relationship, with poles in alternate mounting members being able to be moved upwardly free of their mounting members without interference from baskets of adjacent poles, and with poles in intermediate mounting members being able to be moved upwardly free of their related lower mounting members, without interference from baskets in adjacent aligned mounting members of alternate pairs, and then moved longitudinally relative to their related platform to be free of the mounting assembly.

4,190,167

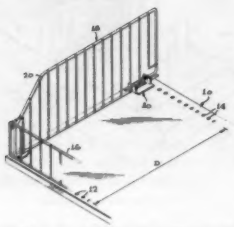
ADJUSTABLE WIRE DIVIDER

Richard E. Wells, 151 Avenida, La Habra, Calif. 91631, and Frank L. Kinda, 1511 5th St., Manhattan Beach, Calif. 90266

Filed May 25, 1978, Ser. No. 909,218

Int. Cl.[2] A47F *5/01*

U.S. Cl. 211—184 **6 Claims**



1. A wire divider useful for installation on shelves with front and rear holes spaced by a moderately variable distance, comprising:

a plurality of wires forming a largely rectangular divider with first and second end portions and upper and lower edges, including an outer wire that extends substantially along a closed path and that has wire end portions that overlap along the second end portion of the lower edge to provide a pair of spaced parallel wire portions extending parallel to the lower edge of the divider;

means mounted at said first end portion of the divider to fit into a shelf hole;

a foot having at least one hook for reception in a shelf hole, said foot having wire-engaging portions slideably engaged with both of said parallel wire portions to slide parallel to said wire portions and prevent rotation of the foot about its axis of sliding; and

a spring biasing said foot to slide in a predetermined direction along said wire portions.

4,190,168

LABEL FOR RETURNABLE AND REFILLABLE BOTTLE AND ASSOCIATED METHOD

Pierre Jacques, 10 Captor Ct., Huntington, N.Y. 11743

Filed Dec. 22, 1978, Ser. No. 972,396

Int. Cl.[2] B65D *23/08*

U.S. Cl. 215—12 R **30 Claims**

16. An article of manufacture comprising a bottle and a stretched sleeve encircling and compressively engaging said bottle, said sleeve having inner and outer portions, said outer portion including a fatty acid and having a greater degree of slip than said inner portion.

4,190,169

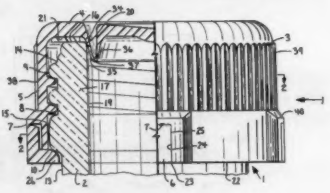
TAMPERPROOF PACKAGE

Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207

Filed Jan. 15, 1979, Ser. No. 3,499

Int. Cl.[2] B65D *41/34*

U.S. Cl. 215—252 **11 Claims**



9. A tamperproof package comprising:

(a) a container having a circumferential sealing finish with a sealing rim at the upper end of said circumferential finish;

(b) inclined cam surfaces with a locking shoulder therebelow on said circumferential finish;

(c) a closure cap adapted to be received over said sealing finish; said closure cap comprising:

(1) a top wall of a size to cover said upper end of said sealing finish;

(2) a depending skirt integrally connected to the marginal edge of said top wall;

(3) inclined camming surfaces on said skirt adapted to engage said sealing finish inclined cam surfaces whereby said surfaces urge said cap upwardly when said cap is rotated for removal;

(4) one or more detent means flexibly connected to said skirt for relative flexing in radial planes toward and away from an axis concentric with and perpendicular to said top wall, said detent means and skirt being integrally connected parts of a unitary cap structure of plastic material; said detent means having circumferentially opposed side edges;

(5) said peripheral skirt and detent means having portions adapted to extend below said locking shoulder with said skirt portions and said detent means having fastener means for interlocking engagement with each other incident to said radial inward movement of said detent means to secure said detent means; and

(6) said detent means respectively including inwardly projecting lugs adjacent their lower extremities for holding

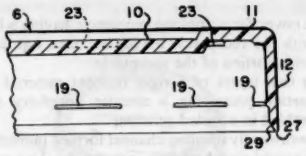
engagement beneath the said locking shoulder whereby rotating the cap for removing same from a container will effect the breaking of the fastener means and outward movement of the detent means.

4,190,170

SNUFF CAN AND THE LIKE

Eugene J. Boyd, Addison, Ill., assignor to United States Tobacco Company, Greenwich, Conn.

Filed Jan. 15, 1979, Ser. No. 3,748
Int. Cl.² B65D *51/16*
U.S. Cl. 215—307 **6 Claims**



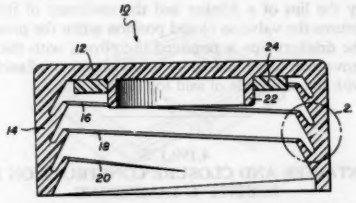
1. A can construction comprising, the combination of, a can formed by a bottom wall and an upwardly extending cylindrical side wall, and a lid comprising a top wall and a downwardly extending peripheral flange having an inside diameter and configuration such as to be snugly received upon the top of said cylindrical side wall, said flange having a circumferential rib structure upon its inner surface projecting radially inwardly from adjacent its bottom edge, said side wall having a circumferential rib structure projecting radially outwardly from said side wall and positioned so that its bottom edge mates with the top edge of the first-named rib structure so as to hold said lid onto the top of said can, said can and said lid being of plastic and being sufficiently deformable so that said flange can be flexed outwardly to remove the lid from the can and to flex when the lid is being installed onto the can, said can having a plurality of vertical vent passageways from the top of said can and past the said rib structure on said side wall, said rib structure on said flange having a plurality of vent gaps which are so positioned that one or more of said vent passageways is in alignment with one or more of said vent gaps.

4,190,171

CLOSURE WITH COMPENSATING THREADS

Lee K. Kulle, Mundelein, and William L. Rudzena, McHenry, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 2, 1979, Ser. No. 9,388
Int. Cl.² B65D *41/04*
U.S. Cl. 215—329 **7 Claims**



1. A container closure for threadedly engaging the externally threaded neck of a container, the closure being internally threaded along its side wall, the improvement comprising:

said closure thread extending inwardly toward the central axis of the closure and defining an angle of less than 45 degrees with respect to said central axis;

said closure thread tapering inwardly as it extends toward said central axis and being generally flexible but being sufficiently rigid to prevent a lower thread from contacting an immediately higher thread during flexing of the threads;

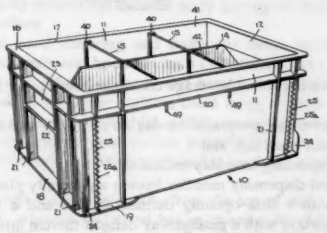
whereby said container closure may be threaded onto an externally threaded container and it will compensate for the variations in the mating thread geometry.

4,190,172

BEVERAGE BOTTLE CASE

Theodor M. Box, 1108 Aileen Rd., Brielle, N.J. 08730

Filed Jun. 1, 1976, Ser. No. 691,627
Int. Cl.² B65D *1/24, 21/00*
U.S. Cl. 220—21 **2 Claims**

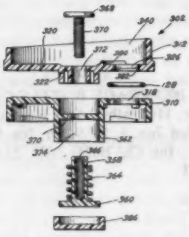


1. In a beverage transport case of the type adapted for stacking with other similar cases and having side, end and bottom walls and upper and lower stacking flanges, and further including inner beverage container-receiving compartmentation, and bottom stacking recesses adapted for engagement with the tops of beverage containers in a case below such case in a stack, said case being of the type wherein the top portions of stored beverage containers extend upwardly beyond the top edge of said case, the improvement comprising inner compartmentation partitions releasably engaged with and disposed within said case and being removable therefrom to provide an open interior of said case for the storage of other goods, vertical slotted portions on the inner surfaces of said side and end walls adapted to slideably receive and mount associated portions of said partitions to provide subcompartmentation within said case, said partitions being capable of disassembly from one another and stowable within said case against the inner bottom thereof, said slotted portions including locking apertures extending through said side and end walls and complementary shaped projections on said partitions releasably engaging said apertures in assembled condition within said case, a raised rectangular reinforcing rib network disposed on the inner bottom of said case having a plurality of spaced parallel longitudinal ribs extending from end to end of the case and a plurality of spaced parallel transverse ribs extending from side to side of the case and intersecting said longitudinal ribs, said network including a plurality of diagonal ribs extending through the corners of said rectangular network to divide said inner bottom into a plurality of congruent right isosceles triangular areas and provide raised bottom support means for containers disposed within said case, said partitions having a plurality of bottom tabs releasably engaging said ribs to lock them in position in assembled condition, and a plurality of exterior vertical flanges on said case having outer sawtoothed edge configurations to provide enhanced frictional contact of said case with handling equipment.

4,190,173
BEVERAGE CONTAINER

LeRoy W. Mason, Baraboo, and Frederick J. Furrer, Wisconsin Dells, both of Wis., assignors to Flambeau Products Corporation, Baraboo, Wis.

Continuation of Ser. No. 877,678, Feb. 14, 1978, abandoned.
This application Aug. 4, 1978, Ser. No. 930,919
Int. Cl.[2] A47G *19/22;* B65D *51/18*
U.S. Cl. 220—203 6 Claims



1. An improved beverage container comprising, in combination:

a beverage receptacle having an open top and a rim about said open top; and

a dispensing assembly including,

a first dispensing member having a generally planar portion with a first opening defined therein and a first sleeve portion with a passageway defined therein interrupted by a radially, inwardly extending ledge,

a second dispensing member having a generally planar portion defining a second opening and a second sleeve portion defining a second passageway;

said first dispensing member and said rim cooperatively defining means for releasably securing said dispensing assembly atop said receptacle so that said dispensing assembly is sealed thereto against beverage leakage and so that said beverage may be placed in said beverage receptacle through said open top;

said first dispensing member and said second dispensing member cooperatively defining means for (1) rotatably pivotly mounting said second dispensing member atop said first dispensing member, said second dispensing member thereby rotatably pivotable to and from a pivotal position wherein said second opening is in registry with said first opening so that the beverage may be dispensed from said beverage receptacle through the openings, and (2) automatically venting said receptacle through the first and second openings when the pressure within said receptacle exceeds a pre-selected maximum pressure when said first and second openings are not in registry,

said mounting and venting means including,

a post member slidably mounted within said first passageway of said first sleeve portion and having an end;

spring means mounted on said post member compressible between said end and said ledge; and

a fastener member fastened to said post member through said second passageway of said second sleeve portion for compressing said spring means to a pre-selected biasing force,

whereby said second dispensing member is maintained in relation to said first dispensing member whenever said pre-selected biasing force is not less than the force of said pressure and is moved to permit said venting through said first opening whenever the force of said pressure acting on said second dispensing member exceeds said preselected biasing force.

4,190,174
DRINKING RECEPTACLE COVER WITH A LIP OPERATED VALVE

Irwin Haimowitz, Los Angeles, Calif., assignor to Thermo-Seal, Inc., Los Angeles, Calif.

Filed Jan. 29, 1979, Ser. No. 7,396
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—254 5 Claims

1. In a cover for a drinking receptacle having a lip operated valve, with the receptacle having an open top defined by a circular rim portion of the receptacle:

a. two thin layers of a rigid resilient material of circular formation presenting a circular periphery and snugly assembled in a nested relation;

b. a downwardly opening channel formed immediately adjacent to said periphery for receiving the rim portion of said receptacle;

c. both of said layers being formed with an opening defined by a straight edge margin proximate the center of the cover diverging side edges extending radially outwardly from the ends of said straight edge margin towards the periphery of the cover and a curved end edge between the side edges and located closely adjacent to the periphery of the cover;

d. the inner layer of said cover having a straight end wall upstanding integrally from the straight edge margin of the opening of said inner layer, side walls upstanding from adjacent the diverging side edges of said opening of said inner layer and a curved end wall upstanding from adjacent said curved end edge of said opening of said inner layer;

e. said side and curved walls being formed with a flange that is integral therewith and outstanding therefrom;

f. the top layer of said cover having a straight end wall upstanding integrally from the straight edge margin of the opening of the top layer, diverging side walls having ends integrally joined to the straight end wall of said top layer and a curved end wall integrally joined to the ends of said side walls more closely adjacent to the periphery of the cover; and

g. said lower and upper layers of that portion of the cover in which the opening is formed constituting a two ply valve with the flange on the lower ply engaging the underside of the top layer of the cover when the valve is in closed position and said straight walls on the upper layer of said cover constituting a hinge which permits a downward movement of the valve when pressure is applied thereto by the lips of a drinker and the resiliency of the hinge returns the valve to closed position when the pressure of the drinkers lips is removed therefrom, with the return movement being limited by the engagement of said flange with the underside of said top layer.

4,190,175
CONTAINER AND CLOSURE CONSTRUCTION FOR RESISTING TAMPERING

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company, New Vienna, Ohio

Filed Mar. 25, 1976, Ser. No. 670,235
Int. Cl.[2] B65D *41/30*
U.S. Cl. 220—270 22 Claims

1. An assembly comprising:

a molded one-piece plastic container having a generally upright wall portion bounding an opening thereto,

a molded one-piece plastic closure having an integrally

molded panel for covering said opening and a skirt surrounding said wall portion,

said container and said closure having interfitting means to provide a snap fit therebetween so that a prying force must be applied to the distal edge of said closure skirt to remove said closure from said container, and

closure shield means molded as part of said container projecting outwardly from and substantially surrounding said wall portion to shield said distal edge of said closure skirt sufficiently that it would be difficult to pry said closure from said container by manual manipulation without the aid of a mechanical device.

said closure shield means including a tearable section immediately adjacent said wall portion for severably attaching

said shield means to said wall portion constructed so that said shield means may be sufficiently detached from said wall portion to expose said distal edge for manual manipulation so that said closure may be pried from said container without the aid of a mechanical device,

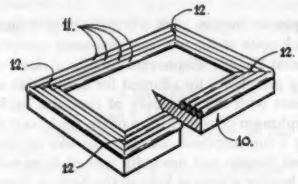
said shield means comprising a first wall projecting outwardly from said wall portion, said tearable section comprising a reduced thickness portion of said first wall engaging said wall portion, said shield means further comprising a second wall projecting upwardly from the outer end of said first wall and generally parallel to said wall portion, said first and second walls cooperating with said wall portion to form a channel for receipt of the lower portion of said closure skirt.

4,190,176

SEALING COVER UNIT FOR A CONTAINER FOR A SEMICONDUCTOR DEVICE

Norman Hascoe, Larchmont, N.Y., assignor to Semi-Alloys, Inc., Mount Vernon, N.Y.

Filed Jan. 23, 1979, Ser. No. 5,790
Int. Cl.² B65D *41/00*
U.S. Cl. 220—359 **5 Claims**



1. A cover unit for hermetically sealing a container for a semiconductor device comprising:

a metallic cover element;

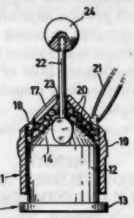
and a plurality of turns of wire of a heat-fusible material formed and disposed on said cover element with the outermost turn substantially in registry with the periphery thereof and said turns being fused thereto at a plurality of spaced points.

4,190,177

PELLET DISPENSER FOR DENTAL PURPOSE

Hans M. Bausch, Monheimer Str. 16, 5000 Koln 60, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,651
Int. Cl.² B65D *83/00*
U.S. Cl. 221—56 **8 Claims**



8. A pellet dispenser for dental purposes comprising:

a substantially cylindrical vertical body having an inclined upper surface,

a weighted hood covering said body and being movable relative thereto, said hood having a cylindrical skirt overhanging said cylindrical body and having an inclined lid facing said body upper surface, there being at least one dispensing aperture in said lid, pellets contained between said body inclined upper surface and said hood lid being dispensable individually through said at least one aperture, and

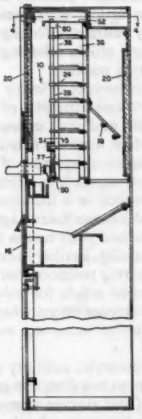
wherein a rod projects upwardly from the top of said vertical body, wherein said hood has an opening for the free passage of the rod, and wherein a knob having a diameter greater than that of said opening is provided on the rod above said hood.

4,190,178

DROP SHELF VENDING MECHANISM

Roderick R. LeBron, III, 6120 N. 30th St., Omaha, Nebr. 68111

Filed May 30, 1978, Ser. No. 910,227
Int. Cl.² G07F *11/06*
U.S. Cl. 221—90 **14 Claims**



1. A drop shelf vending mechanism comprising a rack, a plurality of vertically spaced drop shelves provided with shafts rotatably journalled in said rack and movable from a lock position to a freely rotatable unlocked position, trigger means

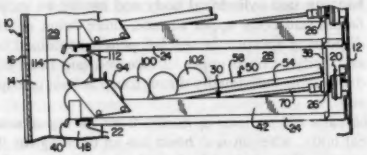
for moving said shafts from a lock position to a freely rotatable position to drop a vending article supported on the shelf for distribution to a customer, an operating shaft supporting said trigger means in sliding relation thereon for movement of said trigger to an operative position for each of said drop shelves and a trip lever means connected to said operating shaft responsive to the operation of a coin selector means to rotate said operating shaft and operate said trigger, said drop shelf shaft having a squared shaft portion adjacent a rounded portion and said trigger being operable to move said shaft from a shelf locking position wherein said square shaft portion is slidably fitted within a mating square hole of said rack to the freely rotatable position wherein said rounded portion is journalled within said mating square hole.

4,190,179

APPARATUS FOR STORING AND DISPENSING GENERALLY CYLINDRICAL PRODUCTS

Charles A. Moss, Lee's Summit, Mo., and Boley A. Andrews, Shawnee Mission, Kans., assignors to The Vendo Company, Overland Park, Kans.

Filed Oct. 4, 1978, Ser. No. 948,376
Int. Cl.[2] G07F *11/30*
U.S. Cl. 221—299 **17 Claims**



1. In a machine for dispensing articles of type adapted to roll upon a surface or revolution thereof:

article storage means for receiving and rollably supporting a plurality of said articles in a row aligned with the direction of rollability of said articles and for urging said articles into successively interengaging relationship with each other and toward one extremity of said storage means from which said articles are to be individually and successively dispensed upon movement thereof beyond said one extremity of said storage means;

shaft means rotatable through a plurality of rotational positions thereof including an article advancement and restraining position, an auxiliary restraint effecting position, a primary restraint removing and article releasing position, and a primary restraint restoring position;

a circumferentially asymmetric, primary restraining element disposed adjacent said one extremity of said storage means, operably coupled with said shaft means for rotation by the latter about an axis offset from but extending in substantially the same general direction as said row of articles, and configured and arranged for engaging and restraining a next to be dispensed article disposed at a location next adjacent said one extremity of said storage means against movement beyond the latter when said shaft means is in said article advancement and restraining, auxiliary restraint effecting, and primary restraint restoring positions thereof and for clearing said next to be dispensed article for movement beyond said one extremity of said storage means when said shaft means is in said primary restraint removing and article releasing position thereof; and

a circumferentially asymmetric, auxiliary restraining member spaced from said element in a direction generally toward the opposite extremity of said storage means, operably coupled with said shaft means for rotation by the latter about an axis offset from but extending in substantially the same general direction as said row of articles, and configured and arranged for engaging and restraining an article disposed in said row next adjacent said location for said next to be dispensed article against movement into said location when said shaft means is in said auxiliary restraint effecting, primary restraint removing and article releasing, and primary restraint restoring positions thereof and for clearing said next adjacent article for movement into said location for said next to be dispensed article adjacent said one extremity of said storage means when said shaft means is in said article advancement and restraining position thereof,

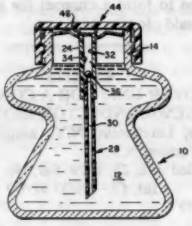
whereby said member will be disposed in a disposition out of engagement and restraining relationship to any of said articles, all of said articles will roll toward said one extremity of said storage means and a next to be dispensed article will occupy said location next adjacent said one extremity of said storage means and be engaged and restrained by said element against movement beyond said one extremity of said storage means when said shaft means is in said article advancement and restraining position thereof, said member will engage and restrain an article disposed in said row next adjacent said location when said shaft means is in said auxiliary restraint effecting position thereof, said element will be cleared out of restraining engagement with said next to be dispensed article to release the latter for movement beyond said one extremity of said storage means while said member continues to engage and restrain an article in said row next adjacent said location when said shaft means is in said primary restraint removing and article releasing position thereof, and said element will be moved when said shaft means is in said primary restraint restoring position thereof into a disposition for engaging and restraining said article disposed in said row next adjacent said location upon movement of same into said location when said shaft means is next in its article advancement and restraining position.

4,190,180

LIQUID DISPENSER

Robert A. Bennet, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Dec. 20, 1978, Ser. No. 971,384
Int. Cl.[2] B65D *37/00*
U.S. Cl. 222—207 **6 Claims**



1. A dispenser for use with a container of liquid having a vertical neck open at the top, said dispenser comprising:

a horizontal flexible diaphragm having a downwardly extending peripheral lip adapted for detachable sealing engagement with the periphery of the open neck whereby the diaphragm covers the top of the neck, said diaphragm having a top disposed concave cup-like recess centrally disposed therein and inwardly spaced from said lip, said recess having a central hole at the bottom thereof;

a vertically elongated tubular element extending through said hole and sealed thereto, said element having an open top end disposed above said hole in the recess, an open bottom end adapted to extend into said container below the level of said liquid, and a vertical bore interconnecting said top and bottom open ends, said bore having a vertically elongated enlarged region with a top and a bottom, said region being disposed intermediate the top and bottom ends of the element, the top end of the element having

a plurality of horizontal spaced conduits interconnecting the bore with the interior of the recess;

a member disposed in said region and slidable up and down therein, said member being moved by gravity to the bottom of the region when the element is upright and being moved by gravity to the top of the region when the element is inverted; and

first and second sealing means cooperating with said member and disposed in the region adjacent the top and bottom thereof respectively, said member when disposed in the top of the region engaging the first means and when disposed in the bottom of the region engaging the second means, each means when engaged by said member forming a closed check valve through which said liquid cannot pass.

4,190,181

DISPENSING DEVICE

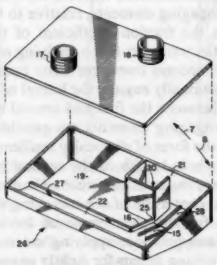
Gerard Arnaud, Beausoleil, France, assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1978, Ser. No. 876,796

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705804; Feb. 11, 1977, 7704108[U]

Int. Cl.² G01F *11/26*

U.S. Cl. 222—456 **8 Claims**



1. A dispenser device for dispensing liquid medium, particularly adapted for being mounted in the door of a dishwasher, the door of which is pivotably mounted on a horizontal pivot axis and is pivotable between a lower position and an upper position, said dispensing device being provided with a reservoir and a dosing chamber for placing in readiness for dispensing a measured quantity of liquid, characterized by the fact that a scooping chamber and an inclined wall are provided, that the bottom of the scooping chamber is on a higher level than the bottom of the reservoir when the door is in its upper position and that the medium stored in the reservoir will flow into the scooping chamber and from there over the inclined wall into the dosing chamber when the door is pivoted into its lower position.

4,190,182

SKI CARRIER

Dana Hickey, Merrimack, N.H., assignor to Ski Tree, Inc., Nashua, N.H.

Filed Feb. 17, 1978, Ser. No. 878,798

Int. Cl.² A45F *5/10*

U.S. Cl. 224—45 S **7 Claims**

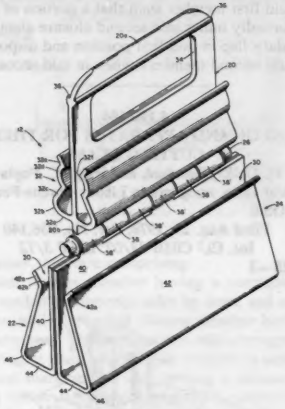
1. A hand held carrier for a pair of skis and a pair of ski poles comprising,

handle means having a hand opening and having first hinge means formed on one edge that extends generally in said first direction,

first and second panel means having second and third hinge means, respectively, formed on their upper edges that extend generally in said first direction, said first, second and third hinge means being mutually intermeshed and axially aligned along said first direction,

a hinge pin pivotally engaging said first, second and third hinge means,

said first and second panel means each including an inner wall, an outer wall and a bottom wall spanning said inner and outer walls that together define a ski-receiving channel, said walls being formed integrally of a resilient material having an inherent tendency to assume a relaxed position, said outer wall being deflected laterally away from a relaxed position proximate said inner wall when one of said skis is received in said channel to develop a gripping force on said one ski, and



clip means formed integrally with said handle means of a resilient material for releasably engaging a pair of ski poles each extending generally in said first direction.

4,190,183

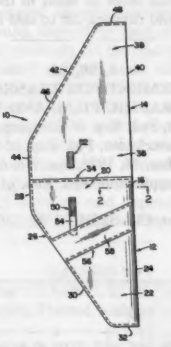
HAND GUN CASE

Donald Yates, 4538 W. Knox, Tampa, Fla. 33614

Filed Oct. 10, 1978, Ser. No. 950,136

Int. Cl.² F41C *33/02*

U.S. Cl. 224—238 **4 Claims**



1. A hand gun case for storage of a pistol comprising a main body having an opening formed in the upper portion thereof to form a pocket or enclosure to receive and house the pistol and a closure flap movable between an open and closed position extending outwardly from said main body adjacent said opening to enclose the pistol within the hand gun case when in said closed position, a first closure element including a first and

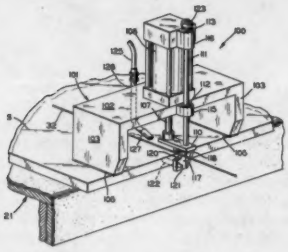
second member formed on said main body and said closure flap respectively to secure said closure flap in said closed position when said first and second members are operatively engaged to each other, said first closure element further includes a secondary flap movable between a first and second position to selectively render said first closure element inoperative when in said second position, and a second closure element formed on said main body to selectively secure said closure flap in said closed position, said secondary flap being secured to said main body adjacent said first member such that a portion of said secondary flap normally unlies said second closure element to retain said secondary flap in said first position and disposed between said first and second members when in said second position.

4,190,184

METHOD OF AND APPARATUS FOR THERMALLY CUTTING GLASS

Waldemar W. Oelke, Rossford, and Ralph C. Poplawsky, Sylvania, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 23, 1978, Ser. No. 936,140
Int. Cl.[2] C03B *33/02*; B26F *3/12*
U.S. Cl. 225—2 **12 Claims**



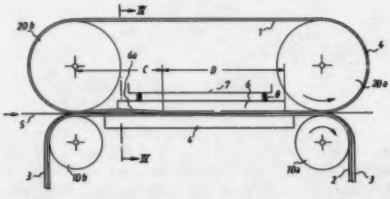
1. A method of cutting glass along a desired line of cut comprising: scoring one edge of a glass sheet, applying concentrated heat against one surface of the glass sheet along a narrow line coincident with a desired line of cut causing said sheet to split progressively from said scored edge in a running cut along said line towards the opposite edge of said sheet, and flexing said sheet along said desired line of cut adjacent said opposite edge of said sheet to assist in the severance of said sheet and confine said running cut to said intended line of cut.

4,190,185

ARRANGEMENT FOR TRANSPORTING PHOTOGRAPHIC FILM, AND THE LIKE

Kurt Thate, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,138
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2503954
Int. Cl.[2] B65H *17/24*, *5/02*
U.S. Cl. 226—172 **7 Claims**



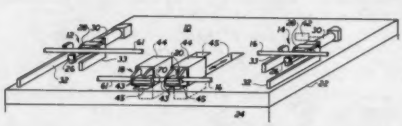
1. An arrangement for transporting flexible sheet material, particularly photographic film, X-ray film, or the like, of the type which should not be physically contacted at its major surfaces, the arrangement comprising in combination, transport-force-applying means for engaging the sheet material at only the lateral edge portions of the sheet material and effecting transport of the sheet material along a predetermined transport path by directly exerting transport force upon only the lateral edge portions of the sheet material, without physically contacting the major central portion of the sheet material in order to prevent damage to such central portion, and including tensioning means operative during sheet material transport for tensioning the sheet material in direction transverse to its transport direction to an extent sufficient to prevent sagging or bulging of the sheet material during such transport, wherein the transport-force-applying means comprises guides and a pair of first conveyor belts trained about the guides to define the transport path, each first belt frictionally engaging a respective one of the lateral edge portions from one of the two sides of the material for exerting frictional transport force upon such lateral edge portion in the direction of elongation of the belt, and wherein the tensioning means comprises frictional engaging elements arranged to frictionally engage the lateral edge portions from the other of the two sides of the material, the frictional engaging elements of the tensioning means being movable in direction away from the longitudinal centerline of the travelling sheet material for effecting the transverse tensioning of the sheet material, wherein the friction coefficient of the frictional engaging elements, relative to the sheet material, is greater than the friction coefficient of the first conveyor belts, wherein the transport-force-applying means further comprises a pair of second conveyor belts cooperating with the first belts to frictionally engage the lateral edge portions of the sheet material between the first and second belts, and wherein the frictional engaging elements are provided on the second belts and have the form of elastically resilient elements extending along the whole length of the second belts and pointing towards the sheet material and inclined in direction away from the longitudinal centerline of the travelling sheet material, the transport path for the sheet material having at least three sections, the transport-force-applying means and the tensioning means comprising means for lightly pressing the conveyor belts against each other during travel thereof along the first and third sections but not the second section to effect outward displacement of the frictional engaging elements along the first and third sections but not the second section, whereby to permit the frictional engaging elements to reassume a non-displaced regenerated condition during travel along the second section so as to make possible renewed outward displacement during travel along the third section.

4,190,186

PREPARATION OF TUBE FOR WELDING

Leonard J. Flowers, Oakmont, Pa.; Melvin R. Fahnestock, Parkersburg, W. Va., and James L. MacIntosh, Richmond, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 15, 1978, Ser. No. 942,542
Int. Cl.[2] B23K *31/06*
U.S. Cl. 228—15.1 **7 Claims**



1. Apparatus for preparing two tubes to be welded together at their ends, and for placing the tube ends in opposed, abutting relationship for welding, the apparatus comprising

means for annealing a length of each tube before the ends of the tubes are placed in abutting relationship for welding,

means for stretching the length of each tube after it is annealed and while the tube is in a heated condition to insure that the length is straight for welding,

means for severing an end portion from the length of each tube after it is annealed to provide two annealed tube ends for welding,

means for placing and holding the annealed ends of the two tubes in abutting position to be welded together, and

means for forcing the abutting ends together for welding and in a manner that will upset the material of the tube ends during welding.

4,190,187

TUBULAR CONTAINERS

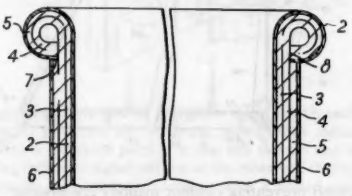
Thomas G. Nelms, London, England, assignor to Rolex Paper Company Ltd., Slough, England

Filed Jul. 12, 1978, Ser. No. 923,904

Claims priority, application United Kingdom, Jul. 20, 1977, 30536/77

Int. Cl.[2] B65D *3/04, 5/04*

U.S. Cl. 229—5.5 **11 Claims**



1. A tubular container whose wall at at least one end is of thinner gauge than, and radially offset relative to, the adjacent wall portion, said thinner gauge wall portion being curled over through more than 270 degrees to constitute a bead occupying the area of said radial offset and projecting radially therefrom for sliding engagement with a closure.

4,190,188

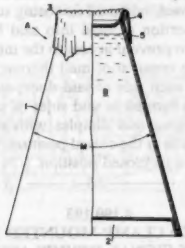
CONTAINER AND CONE FOR SAME

Koichiro Ohmori, Tokyo, Japan, assignor to Honshuseishi Kabushiki Kaisha, Japan

Filed May 5, 1978, Ser. No. 903,065

Int. Cl.[2] B65D *13/04, 41/48, 41/44*

U.S. Cl. 229—5.6 **16 Claims**



1. A sealed container comprising:

a hollow truncated cone shaped body made of paper sheet material having air tightness, the top end of said body being smaller in size than the bottom and thereof, said smaller top end having an opening defined by the upper marginal edge portion of said sheet material which extends upwardly and outwardly;

means for closing said bottom end of said body; and

a cover means made of sheet material being adhered to the inner surface of said marginal edge portion so as to make said container air-tight.

4,190,189

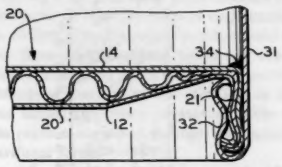
CLOSURE MEMBER FOR A CONTAINER

Laurence R. DeForest, Kansas City, Mo., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Apr. 17, 1978, Ser. No. 897,082

Int. Cl.[2] B65D *3/10*

U.S. Cl. 229—5.6 **10 Claims**



1. A container structure comprising:

a corrugated closure member having a corrugated center layer bounded on opposite sides by inner and outer layer members, said corrugated closure member having a flattened peripheral marginal portion, said corrugated center layer being at least substantially crushed in said flattened peripheral marginal portion in such a manner that the crushed center layer is substantially in contact with said inner and said outer layer members, said flattened peripheral marginal portion being bent at an angle to the central portion of said corrugated closure member to form a depending skirt, the three plies formed by the crushed center layer substantially in contact with said inner and outer layer members extending at least from substantially the outer edge of said depending skirt to the angle formed between said flattened peripheral marginal portion and said central portion, said depending skirt extending completely around the periphery of said central portion;

a single-ply container sidewall formed so as to have a geometrical cross section, transverse to the longitudinal axis of said container structure, at least generally corresponding to the surface area of the portion of said inner layer member in said central portion of said corrugated closure member, said single-ply container sidewall forming an opening on the longitudinal axis of said container structure, said corrugated closure member being positioned within the opening formed by said single-ply container sidewall so as to generally fill the opening formed by said single-ply container sidewall, said single-ply container sidewall having a marginal end portion, said marginal end portion projecting beyond the edge of said depending skirt which is opposite said central portion of said closure member, said marginal end portion extending inwardly to form a rolled rim around said depending skirt with the edge of said marginal end portion extending at least generally to the bend between said depending skirt and said central portion of said closure member.

4,190,190

STRIP MADE UP OF CONSECUTIVE PACKAGE BLANKS

Tuomo Halonen, Toijala, Finland, assignor to Okuli Oy, Toijala, Finland

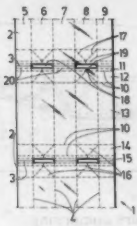
Filed May 9, 1978, Ser. No. 905,035

Int. Cl.[2] B65D *5/72*

U.S. Cl. 229—17 R **4 Claims**

1. A web of package blanks made of cardboard being shaped to form individual packages, in which each blank includes: a plurality of longitudinal folding lines dividing each of the blanks into longitudinal zones; four transverse folding lines formed on each of the blanks dividing the respective blanks into five transverse zones; and oblique folding lines formed at

intersections between the two transverse zones adjacent to a middlemost transverse zone and two longitudinal zones adjacent to an intermediate longitudinal zone permitting the blank to be folded to a package; said middlemost transverse zone being adapted to form rectangular sides of the package; said two transverse zones adjacent to said middlemost zone provides end portions of the package and outermost transverse zones provide seams which seal the package at both of said ends; cutout areas provided in intersections between said outermost transverse zones and said longitudinal zones adjacent to



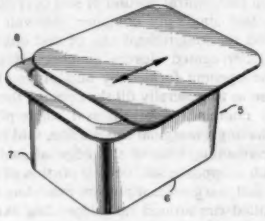
said intermediate longitudinal zone, said cutout areas being covered with plastic material adapted to fold between opposed cardboard layers, as the blank is folded so as to provide sealing material at said seams, said web having a continuous strip of consecutive non-parallel blanks in which said longitudinal folding lines travel in the direction of the web, said transverse folding lines being perpendicular to said direction and said cutout areas being situated at the borderlines between adjacent blanks to thereby permit the web to be folded to the shape of a tube and to form a plurality of packages without the need of cutting the blanks apart.

4,190,191

SLIDING LID FOR FLANGED TRAY

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,232
Int. Cl.[2] B65D *43/00, 77/00, 5/64*
U.S. Cl. 229—43 **5 Claims**



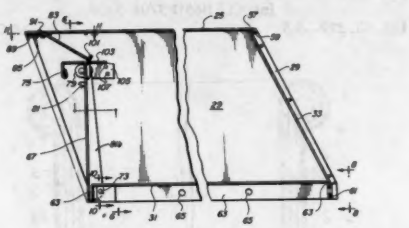
1. A sliding lid for a flanged, open top tray comprising, a rectangularly shaped central panel including side panels foldably attached at two opposed sides thereof wherein the width of the side panels is sufficient to provide, when folded adjacent to said central panel, first portions which are fixedly attached to said central panel in the region adjacent to the foldable connections thereto and second unattached portions which form with said central panel a pair of slide channels for accepting the tray flange at two sides of said tray, the improvement wherein said side panels comprise first and second pairs of foldably attached panels, said first pair of side panels having a length that is substantially equal to the length of the central panel sides to which they are attached and said second pair of side panels having a length less than that of the first pair of side panels and a width substantially equal to that of the first pair of side panels, said second pair of side panels being divided into two portions by embossed lines which extend along the length of said panels and bisect the panels into two substantially equally sized portions, so that when said second pair of side panels are folded over upon themselves adjacent to said central panel, and portions thereof adjacent to the foldable connection between said first side panels and said central panel are adhered together, the unattached portions remain free to form said pair of slide channels for accepting the tray flange at two sides of said tray.

4,190,192

THEFT PREVENTING OUTDOOR MAILBOX

Alexander M. Cornwell, Jr., St. Louis, and Joseph N. Miller, Overland, both of Mo., assignors to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed Nov. 14, 1977, Ser. No. 851,138
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—17 **5 Claims**



1. A theft preventing outdoor mailbox comprising:
a body portion for holding and enclosing mail, said body portion including a top and two sides with the front ends of said sides being inclined so that acute angles are formed between said top and the front ends of said sides;
an access aperture through which mail located in said body portion may be removed formed in the front of said body portion;
a door for selectively closing to prevent, and opening to permit, withdrawal of mail from said body portion through said access aperture, said door pivotably mounted adjacent the bottom of the front ends of said sides and fitting within the inclined front ends of said sides upon being closed;
locking mounting means to provide for the locking of said door to prevent access to the interior of said body portion by unauthorized parties;
a mail slot opening to the interior of said body portion when said door is closed, said mail slot being sufficiently large to permit the insertion of mail into said body portion and small enough to prevent access to the interior of said body portion for the removal of mail therein;
a tab located on each side of said door; and
a pair of dimples formed in said sides of said body portion, said tabs engaging said dimples with an interference fit when said door is in the closed position, thereby maintaining said door in its closed position.

4,190,193

SELF-CONTAINED CLAMP-MOUNTED PIVOTAL ARM MAILBOX SIGNAL DEVICE ASSEMBLY

George T. Smith, 7401 N. Williams Rd., Lansing, Mich. 48910

Filed Sep. 27, 1978, Ser. No. 946,135
Int. Cl.[2] A47G *29/12*
U.S. Cl. 232—35 **3 Claims**

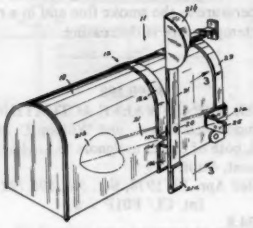
1. A self-contained clamp-mounted mailbox signal device assembly comprising:
a first flexible band support member having a mailbox-engaging hooked portion at one end thereof and vertically-oriented signal arm support flange at the opposite end

thereof, said first flexible band support member configured to provide a first horizontal adjustment flange proximate to said vertically-oriented signal arm support flange;

a second flexible band support member having a mailbox-engaging hooked portion at one end thereof and a second horizontal adjustment flange at the opposite end thereof, said second horizontal adjustment flange parallel to and spaced apart from said first horizontal adjustment flange;

connector tightening means in association with said first and second horizontal adjustment flanges so as to tighten said first and second flexible band support members into clamping engagement against the outer surface of a mailbox;

a signal arm pivotally mounted on said vertically-oriented signal arm support flange so as to pivot within a vertical



plane along one side of a mailbox upon which said band support members are mounted, said pivotal signal arm having a weighted portion at one end thereof and having a flag indicator signal portion at the other end thereof; and

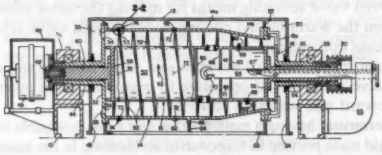
an angular support arm extension with a bolted clamping plate clampingly securing said arm on the door flange of the mailbox proximate to said band support members, said support arm extension extending outwardly so as to supportably engage said weighted portion of said signal arm so as to maintain said signal arm in a substantially horizontal position when the mailbox door is closed, said support arm extension disengaging from said weighted portion when the mailbox door is opened so as to permit said signal arm to automatically pivot to an upright vertical signal position.

4,190,194

SOLIDS LIQUID SEPARATING CENTRIFUGE WITH SOLIDS CLASSIFICATION

Clifford L. Amero, East Walpole, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Jul. 28, 1978, Ser. No. 928,995
Int. Cl.[2] B04B *1/20*
U.S. Cl. 233—7 **9 Claims**



1. In a solids-liquid separating centrifuge of the type having a bowl with a reduced diameter end outlet for solids, a helically bladed conveyor within the bowl extending substantially from end to end of the bowl and arranged to move solids settling in said bowl toward said end outlet, means for rotating said bowl and conveyor about a common axis to convey a first portion of the solids settling in said bowl to said end outlet, and feed means for discharging slurry into said bowl at a feed point spaced from said end outlet, the improvement comprising:

classifying means for segregating and separately discharging from the bowl a second portion of the slurry solids having mainly characteristics different from the solids principally contained in said first portion such that they are relatively slower in settling and more difficult for said conveyor to convey;

said classifying means including at least one nozzle outlet through the peripheral wall of the bowl having an outlet passage with its inlet exposed to the path of movement of solids by the conveyor, intermediate the ends of the conveyor;

said conveyor having a unidirectional pitch directed toward said bowl end outlet at opposite sides of said nozzle inlet, so that solids settling in said bowl at the side of said nozzle outlet remote from said bowl end outlet are conveyed thereby to said nozzle inlet, solids of said first portion are conveyed thereby across said nozzle inlet and on toward said bowl end outlet, and slurry containing solids of said second solids portion is ejected through said nozzle passage by centrifugal force;

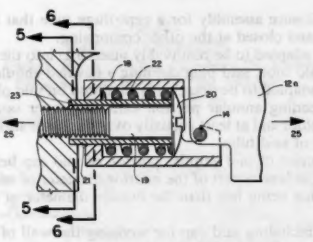
and means for collecting the outputs from said end outlet and said classifying means.

4,190,195

HANGER DESIGN FOR A SWINGING CENTRIFUGE ROTOR

Steven J. Chulay, Los Altos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 14, 1979, Ser. No. 20,388
Int. Cl.[2] B04B *5/02*
U.S. Cl. 233—26 **4 Claims**



1. In a swinging bucket centrifuge rotor of the type having a plurality of peripheral cavities equally spaced about the axis of rotation of the rotor, each of the cavities having a hanger member mounted therein for pivotally supporting a bucket, the bucket adapted to pivot from a vertical position when the rotor is at rest to a horizontal position when the rotor is rotating, the hanger member being radially movable with respect to the axis of rotation, for each hanger member and cavity the improvement comprising:

a non-circular recess formed in an inner wall of the cavity;

an elongated guide sleeve having a non-circular cross section, one end of the guide sleeve being disposed in the non-circular recess and confined therein against rotational movement by the cooperating non-circular shape of the guide sleeve and the recess, the guide sleeve extending radially outward into the cavity;

fastening means extending through the guide sleeve, having one end fastened to the rotor within the recess;

the bucket hanger member being mounted on the guide sleeve, the hanger member including a portion thereof conforming to and closely abutting the exterior surface of the non-circular guide sleeve, thereby permitting the hanger member to slide radially on the guide sleeve but preventing rotation thereof; and

spring means confined in an area defined by the interior of the hanger member and the exterior to the guide sleeve

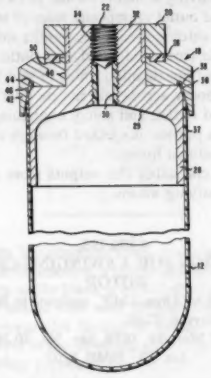
exerting a radial force on the hanger member in a direction toward the axis of rotation of the rotor.

4,190,196

CENTRIFUGE TUBE CAP

Max J. Larsen, Woodbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1975, Ser. No. 572,711
Int. Cl.[2] B04B *15/00*; B65D *45/00*
U.S. Cl. 233—26 **9 Claims**



1. A closure assembly for a centrifuge tube that is open at one end and closed at the other comprising:

a plug adapted to be removably insertable into the open end of said tube, said plug defining a beveled shoulder,

a cap adapted to be detachably mounted on said plug with a depending annular portion extending over said beveled shoulder and at least partially over the outer surface of the wall of said tube,

the interior of said annular portion of said cap being flared with at least a part of the interior diameter of said annular portion being less than the outside diameter of said tube, and

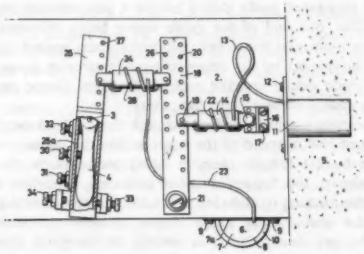
means including said cap for wedging the wall of said tube between the beveled shoulder of said plug and the flared portion said cap, thereby to form a seal for the open end of said tube.

4,190,197

DEVICE FOR DRAFT CONTROL

Stig Werne, Hermelinsv 13, S-43300 Partille, Sweden

Filed Dec. 22, 1977, Ser. No. 863,244
Claims priority, application Sweden, Dec. 27, 1976, 7614555
Int. Cl.[2] F23N *3/00*
U.S. Cl. 236—1 G **7 Claims**



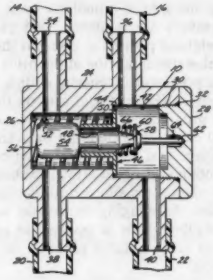
1. Device for automatic draft control of a furnace having an oil burner, a smoke flue, and an exhaust valve located in the smoke flue, part of the smoke flue located nearest after the exhaust valve as counted in the direction of the exhaust comprising a metal tube which is connected with the wall of a chimney, said device comprising a first sensoring device provided on said metal tube and subjected to the influence of the temperature prevailing in said tube, means for the transmission of the registration of the first sensoring device to the exhaust valve, a second sensoring device provided in said chimney wall, and means for the transmission of the registration of the second sensoring device to the exhaust valve, said first and second sensoring devices being connected with the exhaust valve in such a manner that the combined registration of said sensoring devices is transmitted to the exhaust valve so that said valve can be moved in a shutting-off direction upon an increased temperature in the smoke flue and in a reverse direction when the temperature is decreasing.

4,190,198

OIL COOLER BYPASS VALVE ACTUATING MEANS

Dennis W. Casuga, Pico Rivera, and William C. Hauser, Hacienda Heights, both of Calif., assignors to Lockhart Industries, Inc., Paramount, Calif.

Filed Apr. 12, 1978, Ser. No. 895,792
Int. Cl.[2] F01P *7/02*
U.S. Cl. 236—34.5 **7 Claims**



1. In an oil cooler bypass valve including a valve housing having an elongated valve chamber communicating with oil supply, oil return, cooler supply and cooler return lines; and a valve member having a cooling position for directing oil from the oil supply line to the cooler supply line for circulation through a cooler and from the cooler return line to the oil return line, and further having a warm-up position for directing oil from the oil supply line back to the oil return line, an improved valve actuating means for moving the valve member between the warm-up and cooling positions, said valve actuating means comprising:

a main spring engaged between said valve housing and said valve member and operative to urge said valve member toward said warm-up position;

a thermostat having a main portion and a pin extensible from said main portion in response to an increase in the temperature of oil in said valve chamber, said pin being engaged upon said valve housing;

a relief spring engaged between said valve member and said main portion for moving said valve member toward said cooling position upon extension of said pin relative to said main portion, said main spring being compressible to enable movement of said valve member in one direction under the influence of relatively high pressure acting on one side of said valve member, said relief spring being compressible to enable movement of said valve member in the opposite direction under the influence of relatively

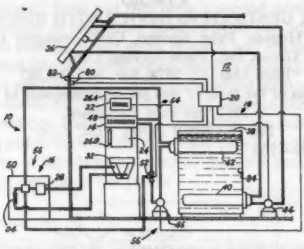
high pressures acting on the other side of said valve member.

4,190,199

COMBINATION HEATING SYSTEM INCLUDING A CONVENTIONAL FURNACE, HEAT PUMP AND SOLAR ENERGY SUBSYSTEM

Richard E. Cawley, Hurst, and Paul K. Buckley, Ft. Worth, both of Tex., assignors to Lennox Industries Inc., Dallas, Tex.

Filed Jan. 6, 1978, Ser. No. 867,469
Int. Cl.[2] F27J 3/02
U.S. Cl. 126—419 **10 Claims**



1. A system for heating an air stream to condition an enclosure comprising, in combination:

a heat pump having an inside coil in communication with said air stream and an outside coil;

a solar energy subsystem operable in a direct heating state to heat said air stream, said solar energy subsystem including storage means for storing heat derived from solar energy, a solar energy collector thermally coupled to said storage means, and coil means in communication with said air stream and in heat transfer relationship with said storage means for transferring heat from said storage means to said air stream;

enclosure thermostatic means for producing a first enclosure signal, a second enclosure signal and a third enclosure signal whenever the temperature in said enclosure drops below a first predetermined enclosure threshold, a second predetermined enclosure threshold and a third predetermined enclosure threshold, respectively;

storage thermostatic means for producing a first storage signal whenever the temperature in said storage means drops below a first predetermined storage threshold;

furnace means for heating said air stream; and

control means responsive to said enclosure thermostatic means and said storage thermostatic means for coordinating operation of said heat pump, said furnace and said solar energy subsystem, said control means activating said solar energy subsystem in response to said first enclosure signal, activating said heat pump in response to said first enclosure signal and said first storage signal, activating said heat pump in response to said second enclosure signal, and activating said furnace means in response to said third enclosure signal.

4,190,200

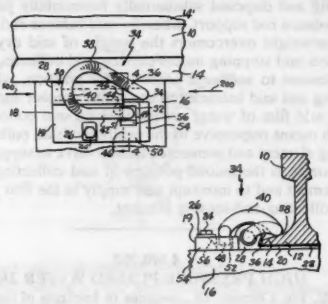
RAIL CLIP ASSEMBLY

Warren P. Morrow, Silver Spring, Md., assignor to Scotco, Inc., Silver Spring, Md.

Filed Mar. 17, 1978, Ser. No. 887,781
Int. Cl.[2] E01B 9/48
U.S. Cl. 238—349 **12 Claims**

1. A rail clip for fastening a longitudinally extending railway rail to an underlying support, which comprises:

a single rod having a first end portion, a second end portion and a bent portion intermediate said first and second end portions adapted to contact and thereby retain said rail against said support, said first end portion comprising a first elongated end portion positioned in use substantially parallel to said longitudinally extending rail, said second end portion comprising a second elongated end portion parallel to said first elongated end portion and means extending integrally from said second elongated end portion for locking said rod against longitudinal movement



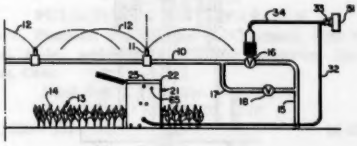
wherein said locking means comprises a unitarily formed terminal portion extending downwardly from said second elongated end portion, wherein said terminal portion is formed at a substantially right angle to and has substantially the same diameter as said second elongated end portion, and wherein said terminal portion defines the terminating end of said second end portion of said rod.

4,190,201

MISTING CONTROL

Edward C. Geiger, 500 E. 7th St., Lansdale, Pa. 19446

Filed Sep. 22, 1978, Ser. No. 944,965
Int. Cl.[2] A01G 25/16
U.S. Cl. 239—65 **1 Claim**



1. In an automatic misting system for cutting beds or the like having at least one misting nozzle operable upon a supply of liquid thereto to direct a mist of spray over said bed, and a valve to control the supply of spray liquid to said nozzle; an automatic control means to operate said valve comprising a housing having a pair of spaced-apart sidewalls and a peaked roof, corrosion-resistant bushings mounted on said sidewalls opposite one another, said bushings having a portion extending through said sidewalls and caps engaging said extending portion, a non-absorbent collector positioned in the atmosphere above the bed and in the path of the mist from the spray nozzle to collect thereon a film of water of a thickness determined by the surface tension thereof, a collecting-and-sensing element comprising a balance rod underlying said roof, a support for said balance rod, said balance rod being integrally attached to said support, said support having pointed ends which are pivotally mounted in said bushings and which cooperate with said caps to minimize friction in the pivotal movement of said support, said collector being mounted at one end of said balance rod, and a counterweight mounted on the opposite end of said balance rod to overcome the weight of said collector when it is dry, but of insufficient weight to overcome the weight of said collector when it is provided with a film of liquid thereon, said counterweight being positioned within said

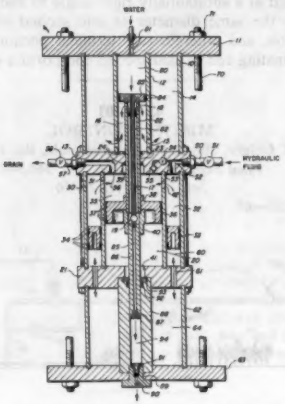
housing and operable upon overbalance thereof by said collector with its film of water to cause the collecting-and-sensing element to assume a first limit position wherein the counterweight is engaged against said roof to limit the pivotal movement thereof in one direction, opposed stopping means positioned within said housing to limit pivotal movement of said collecting-and-sensing element in the other direction, said stopping means being a rod laterally disposed within said housing and disposed substantially horizontally parallel with said balance rod support, whereby said balance rod, when said counterweight overcomers the weight of said dry collector, contacts said stopping means causing said collecting-and-sensing element to assume a second limit position, wherein said housing and said balance rod are out of contact and remain so while said film of water accumulates on said collector, and a switch means responsive to the position of said collecting-and-sensing element and connected to said valve to supply water to said nozzle in the second position of said collecting-and-sensing element and to interrupt said supply in the first position of said collecting-and-sensing element.

4,190,202

HIGH PRESSURE PULSED WATER JET

Gene G. Yie, Chicago, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Jul. 3, 1978, Ser. No. 921,216
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—101 **26 Claims**



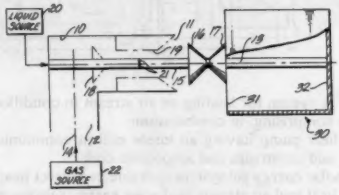
1. A thrust generator comprising:
a single substantially gas-tight combination working-cocking cylinder, a power piston adapted for substantially gas-tight reciprocating motion within said cylinder and dividing said cylinder into a substantially gas-tight working cylinder containing working fluid on one side of the power piston and a substantially gas-tight cocking cylinder containing cocking fluid on the other side of said power piston;
a closed driving gas chamber in pressure transmission communication with said working cylinder and containing driving gas providing driving force to said power piston for the power stroke, said driving gas being pressurized in said driving gas chamber by movement of said power piston reducing the volume of said working cylinder;
a cocking fluid chamber in fluid transfer communication with said cocking cylinder and containing cocking fluid providing force to said power piston for the cocking stroke of said power piston;
means for cyclic supplying pressurized hydraulic fluid to and draining hydraulic fluid through a hydraulic fluid outlet valve from said working-cocking cylinder;
a cocking fluid communication cylinder extending from the working chamber side of said power piston through the central portion of said working chamber into said cocking fluid chamber providing passage of said cocking fluid and centered movement of said power piston in said working-cocking cylinder;
a floating piston separating said hydraulic fluid from gas;
trigger valve means providing initial flow of working fluid into said working cylinder to initiate the power stroke of power piston; and
control means for control of said hydraulic fluid outlet valve and trigger valve.

4,190,203

VORTEX GENERATING DEVICE WITH RESONATOR

Nathaniel Hughes, Palm Springs, Calif., assignor to Hughes Sciences Group, Inc., Palm Springs, Calif.

Filed Mar. 13, 1978, Ser. No. 886,287
The portion of the term of this patent subsequent to Mar. 11, 1997, has been disclaimed.
Int. Cl.[2] B05B *17/06*; F15C *1/16*
U.S. Cl. 239—102 **90 Claims**



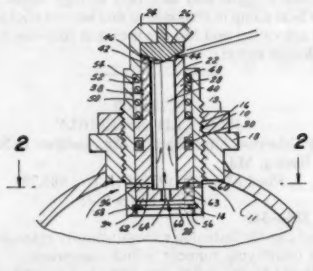
1. A vortex generating device comprising:
a flow passage having a fluid inlet and a fluid outlet;
a source of gas under pressure larger than the ambient pressure into which the outlet opens connected to the inlet to cause gas to pass through the flow passage;
means for generating in the gas a plurality of tornado-like vortices arranged in a ring about the flow axis, the vortices rotating about the flow axis;
a resonator disposed at the outlet external to the passage to intercept fluid flowing vortically through the passage; and
an external bluff body lying between the outlet and the resonator.

4,190,204

SHOWER NOZZLE FOR FABRIC CONDITIONER

Charles B. Nicholson, Glens Falls, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,051
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—109 **8 Claims**



1. In combination with a spray pipe, a spray nozzle, said nozzle comprising; a generally tubular body in alignment with the spray hole through the wall of said pipe, a bore of said

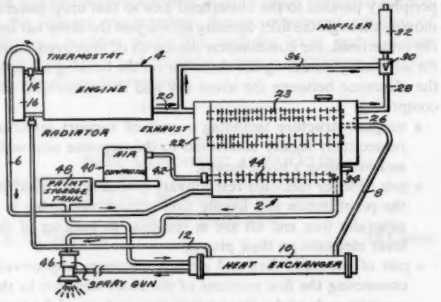
tubular body, a piston slidably fitted in said tubular body within said bore, a central passage formed in said piston and communicating the interior of said spray pipe to the outside thereof, a first seal means cooperating with said tubular body and said piston and confining the contents of said spray pipe to said central passage, a valving member of said tubular body and disposed on the centerline of said central passage, a spray position of said piston with the upper end thereof abutting said valving member, said piston maintained in said spray position by the force of the content of said spray pipe pressing thereagainst, a blocking surface of said valving member overlying a first portion of said central passage and blocking a portion thereof in said spray position, a spray surface of said valving member spaced from and overlying a second portion of said central passage in said spray position whereby liquid exiting said central passage in said spray position will impinge thereon to be formed into and directed as a spray, a purging position of said piston with the upper end thereof spaced from said valving member, means for shifting the piston between the spray and purged positions, and flow volume control responsive to shifting of the piston between the spray and purge positions to vary the volume of liquids being directed from the spray pipe into the central passage of the piston.

4,190,205

ROAD MARKING APPARATUS AND METHOD

Wayne R. Mitchell, Muncy, Pa., assignor to Prismo Universal Corporation, Montgomery, Pa.

Filed Oct. 3, 1978, Ser. No. 949,420
Int. Cl.[2] B05B *1/24*
U.S. Cl. 239—129 **7 Claims**



1. Apparatus for spraying and heating a quick-drying traffic paint composition onto a road surface to a temperature of at least 120° F., said apparatus comprising:

a vehicle driven by an internal combustion engine,

an air compressor powered by said engine,

a paint storage tank,

a paint sprayer,

heat collection means having an internal space for holding engine liquid including means for providing heated engine liquid to said internal space, a first set of tubes within and passing through said internal space in communication with and for passing hot engine exhaust gases through said internal space, said first set of tubes being in thermal contact with the liquid contained in said collection means, and a second set of tubes within and passing heated compressed air from said compressor in thermal contact with the liquid contained in said internal space; and

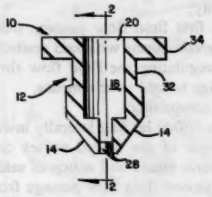
a heat exchanger in fluid communication with said collection means and supplied with said heated liquid for heating traffic paint passed therethrough, traffic paint inlet means connected to said storage tank and paint outlet means connected to said paint sprayer, and inlet means for receiving the heated liquid from said collection means and outlet means for exhausting the liquid to said engine.

4,190,206

DRIP IRRIGATION SYSTEM

Gordon E. Atkinson, and Kenneth C. Tregillus, both of Yellow Springs, Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Jun. 30, 1978, Ser. No. 920,804
Int. Cl.[2] B05B *1/02, 1/30*
U.S. Cl. 239—271 **9 Claims**



1. In a one-piece elastomeric flow control valve including a body portion having a flow port extending therethrough and terminating in an inlet opening at one end and an outlet at the opposite end, the improvement comprising:

said inlet opening is defined by a central section and a pair of end sections positioned at opposite ends of said central section,

said elastomeric material possesses an elasticity such that external pressure applied to said inlet end of said valve causes said central section substantially to close while the open cross sectional area of said end sections varies inversely in response to variations in said external pressure to regulate flow through said flow control valve at a substantially constant flow rate, and

said end sections of said inlet opening extend inwardly of said valve a relatively short distance to provide precise control over flow through said inlet opening.

4,190,207

PULSATING SPRAY APPARATUS

Stephen C. Fienhold, and Michael A. Cammack, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Jun. 7, 1978, Ser. No. 913,284
Int. Cl.[2] B05B *1/08, 1/18*
U.S. Cl. 239—381 **16 Claims**

1. In a pulsating spray apparatus that includes:

a housing having a fluid inlet and a fluid discharge outlet;

means in said housing defining a flow path from said inlet to said outlet;

pulsating means in said flow path for cyclically interrupting the flow of fluid from said inlet to said outlet and causing a pulsating spray to be discharged therefrom, said pulsating means including a forced vortex driven turbine rotatable within a cavity defined with said housing;

control means for adjusting the fluid flow from said inlet to said outlet;

nozzle means for tangentially imparting driving force to said vortex and creating a predetermined static fluid pressure within said cavity;

means defining a first fluid flow passage from said control means to said nozzle means with said control means including means for regulating the fluid flow through said first fluid flow passage to said nozzle means;

the improvement comprising:

means defining an orifice leading laterally inward toward the outer edge margin of the forced vortex created by flow through said nozzle means and action of said turbine;

means defining a second fluid flow passage from said control means to said orifice;

said control means further including means for selectively regulating fluid flow through said second fluid flow passage to said orifice;

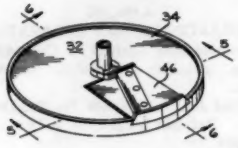
and said orifice being oriented relative to said turbine to deliver its fluid flow in a direction which reduces the effect of said forced vortex in driving said turbine.

4,190,208

PROCESSOR AND CUTTER DISC

Robert L. Schaeffer, LeRoy, and Bhim S. Madan, Brockport, both of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,348
Int. Cl.[2] B02C *18/18*
U.S. Cl. 241—92 **6 Claims**



1. In a food processor having a power base and lid-covered bowl with an inner surface, a feed chute through the lid to a cutting disc rotated by a shaft extending into and terminating in the bowl, an improvement in said disc comprising,

a peripheral flange thereon extending upwardly adjacent the bowl inner surface,

a single substantially rectangular locking-edged opening through the disc and flange on one side only of the disc center and terminating short of and adjacent the center,

a narrow slot centrally of the opening and extending across the disc center,

a depending hub at the disc center and crossing said slot to receive the shaft therethrough,

a removable locking-edged cutter insert having a tab matching said slot and radially slidable into said opening and slot to contact the hub,

a stepped sleeve on said tab disposed on and vertically locating the insert on the shaft,

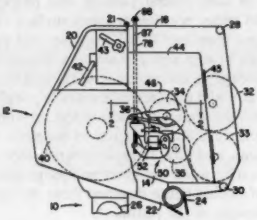
whereby the disc is totally carried by the insert and vertically and radially restrained by the locked edges and shaft respectively, and fixedly spaced from the lid by said step for single disc multiple capability with different inserts.

4,190,209

ADJUSTABLE SHEAR BAR FOR A HARVESTER CUTTERHEAD

Harold E. deBuhr; Merlyn D. Bass; Jerry L. Krafka, all of Ottumwa; David L. Wolf, and Kenneth R. Christopher, both of Cedar Falls, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 3, 1978, Ser. No. 921,282
Int. Cl.[2] B02C *18/16*
U.S. Cl. 241—101.7 **14 Claims**



1. In a forage harvester having a mobile frame, a cutterhead housing mounted on the frame and having opposite side walls and an inlet opening, a rotary cutterhead mounted in the housing and having a plurality of knives with cutting edges at the cutterhead periphery generating a cylinder as the cutterhead rotates and a generally horizontal transverse shear bar extending between the opposite side walls adjacent the cutterhead periphery parallel to the cutterhead axis so that crop material moving through the inlet opening moves past the shear bar into the cutterhead, the combination therewith of improved means for adjustably mounting the shear bar on the housing to adjust the clearance between the shear bar and the cutterhead and comprising:

a support structure including a pair of support members respectively rigidly connected to the opposite side walls and including a pivot means;

a pair of lever elements respectively pivotally mounted on the pivot means and having first portion swingable in a generally fore and aft arc in response to rocking of the lever elements on their pivots;

a pair of generally fore and aft link members respectively connecting the first portions of the lever elements to the opposite ends of the shear bar so that rocking of the lever elements shifts the opposite ends of the shear bar in a generally fore and aft direction toward or away from the cutterhead periphery;

a pair of clamping means respectively operatively associated with the opposite ends of the shear bar for generally vertically clamping the opposite ends of the shear bar against the support structure so that the shear bar is shiftable in said fore and aft direction only upon exertion of a sufficient force through the link members to overcome the generally vertical clamping force exerted by the clamping means; and

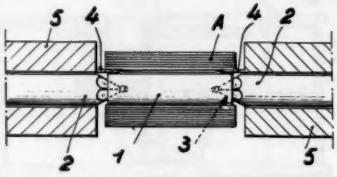
a pair of force multiplying means respectively connected to the respective lever elements and including input elements, each force multiplying means being operative to rock the lever member about its pivots upon exertion of an input force on the input elements sufficient to overcome the clamping force exerted by the clamping means, said clamping force being substantially greater than the input force, whereby exertion of said input force on an input element in one direction shifts the end of a shear bar toward the cutterhead periphery and exertion of said input force in the opposite direction shifts the end of the shear bar away from the cutterhead periphery.

4,190,210

METHOD AND ARRANGEMENT FOR WINDING CAPACITORS

Cataldo C. Chirico, 107 Passage Emile Boutrais, 94120 Fontenay-sous-Bois, France

Filed Nov. 16, 1977, Ser. No. 852,038
Claims priority, application France, Dec. 3, 1976, 76 36456
Int. Cl.[2] H01G *13/02, 7/00*
U.S. Cl. 242—56.1 **12 Claims**



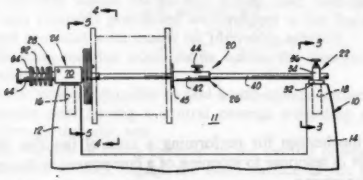
1. An arrangement for winding a film onto a mandrel so as to form a capacitor thereon, comprising means for rotatably supporting a mandrel onto which a film is to be wound; means for rotating the mandrel so as to wind the film onto the latter including two centers at least one of which is rotatable, said centers being movable between an operative position in which they engage the mandrel so as to rotate the latter, and an inoperative position in which they are withdrawn from the mandrel; and retaining means displaceable between a first position in which it is superposed over an initial portion of the film wound onto the mandrel so as to retain the initial portion of the film on the mandrel, during subsequent winding of additional portions of the film onto the latter, and a second position in which said retaining means is withdrawn from the film wound on the mandrel.

4,190,211

REEL MOUNTING APPARATUS

Harlo W. Janzen, Rte. 2, Box 74, Balko, Okla. 73931

Filed Oct. 10, 1978, Ser. No. 949,815
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—86.7 **13 Claims**



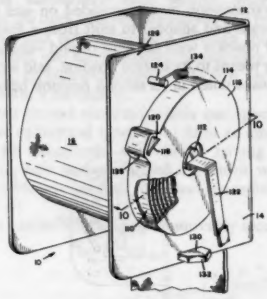
1. A reel mounting apparatus comprising:
a pair of bracket subassemblies adapted for securement to the vertically extending sides of a truck;
an elongated, two-part shaft assembly including
a shaft detachably mounted in one of said bracket subassemblies; and
a shaft extension detachably coupled to said shaft and projecting coaxially therefrom;
a sleeve slidably surrounding said shaft extension, and movably mounted on said other bracket subassembly to facilitate axial movement along the shaft extension;
a friction element adjacent an end of said sleeve disposed between said brackets and movable therewith on the shaft extension; and
spring means biasing said sleeve along said shaft extension toward said one bracket subassembly.

4,190,212

COMFORT MECHANISM FOR SEAT BELT RETRACTOR

Joseph M. Cachia, New Haven, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 27, 1977, Ser. No. 791,618
Int. Cl.[2] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **5 Claims**



1. A safety belt retractor comprising a frame, a shaft mounted for rotation on said frame, a spool mounted on said shaft and having seat belt webbing wound thereon, first means biasing said spool in a rewind direction and having an inner end attached to said shaft and an outer end, and means for reducing the tension of the webbing against the wearer due to the bias force of the first biasing means, said tension reducing means comprising a second biasing means biasing said spool in the rewind direction and having a lower biasing force than said first biasing means, blocking means having an operable position at which it prevents said first biasing means from rotating said spool and an inoperable position at which it does not prevent such rotation, and means for moving said blocking means between said operable and inoperable positions, said blocking means being moved into said operable position after extension of the seat belt webbing to a position of use, said second biasing means operable to rewind said webbing when said blocking means is in its operable position, wherein said blocking means comprises a stop member provided on a rotary member mounted for rotation on said shaft, said stop member being fixed with respect to said rotary member, and a blade member having a thin, elongated shape, one end of said blade member being connected to said shaft so as to fix said blade member for rotation with said shaft, the other end of said blade member being operable to engage said stop member upon rewind from said extended position to prevent rotation of said rotary member with respect to said shaft, said rotary member being connected to said outer end of said first biasing means.

4,190,213

SAFETY BELT TAKE-UP DEVICE

Takeo Ueda, Fujisawa, Japan, assignor to NSK-Warner K. K., Tokyo, Japan

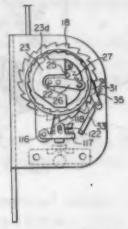
Filed Sep. 11, 1978, Ser. No. 941,364
Claims priority, application Japan, Nov. 2, 1977, 52-147631[U]
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **8 Claims**

1. A safety belt take-up device provided with a double sensing type emergency-lock mechanism comprising:
webbing draw acceleration sensing means connected to a take-up spindle for the webbing and adapted to shift from a first position to a second position when webbing is drawn out at an acceleration greater than a predetermined value;
vehicle acceleration sensing means adapted to shift from a

first position to a second position in response to a predetermined vehicle acceleration;

first transmission means connectible to said take-up spindle in accordance with the shift from said first position to said second position of said webbing draw acceleration sensing means and/or said vehicle acceleration sensing means and adapted to shift from a first position to a second position due to the webbing draw-out force;

second transmission means provided on said first transmission means and adapted to shift from a first position to a second position with the shift of said vehicle acceleration sensing means to its second position, said second transmission means when in its second position being connectible



to said take-up spindle to move said first transmission means from its first position to its second position, said second transmission means comprising two opposed levers pivotally supported on said first transmission means, a limiting member for limiting the angle formed by and between said two levers, and bias means for biasing said levers toward a maximum angle direction, one of said levers being mesh-engageable with a ratchet gear formed on said take-up spindle when said second transmission means is in its second position; and

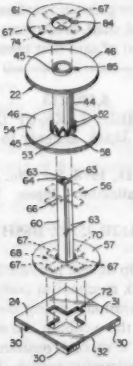
lock means for preventing the draw-out of the webbing when said first transmission means has shifted to its second position.

4,190,214

PACKAGE CONSTRUCTION FOR COILABLE MATERIAL AND METHOD OF PACKAGING AND DISPENSING SAME

Jerome S. Bond, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 2, 1978, Ser. No. 957,278
Int. Cl.[2] B65H *49/18*
U.S. Cl. 242—138 **23 Claims**



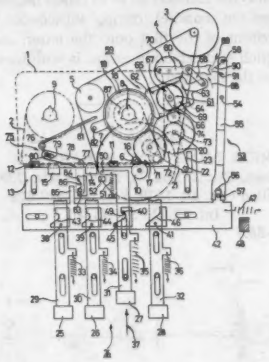
1. In a package construction for coilable material comprising a reel for coiling said coilable material thereon and a container for containing said reel, said container comprising a plurality of walls; the improvement wherein said reel is made as a part of one of said walls, said one wall having an inner surface and an outer surface, a plurality of feet attached against said outer surface, said one wall with its feet defining a pallet for said container and its reel; said reel disposed substantially centrally on said one wall, said container comprising tubular construction having an open end, said tubular construction being disposed around said reel with the terminal edge of said open end above said outer surface.

4,190,215

TAPE RECORDER STOPPING MECHANISM

Istvan Hochbaum; Mandred Ketzer; Friedrich Laa, and Johann Veigl, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1978, Ser. No. 941,546
Claims priority, application Austria, Sep. 14, 1977, 6607/77
Int. Cl.[2] B65H *59/38*
U.S. Cl. 242—186 **7 Claims**



1. A mechanism for performing a control function in an apparatus in response to stopping of a component in the apparatus, comprising

an actuating device for performing a control function,

a component mounted in the apparatus, and means for rotating the component,

a pivotally mounted lever,

means for pivotally oscillating said lever in response to rotation of said component, and for moving said lever to a given position in response to stopping of said component,

a connecting rod,

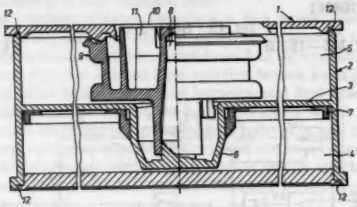
means for reciprocating the connecting rod, and

a coupling rod linking said lever and said connecting rod, the rods being arranged so that while the lever is in the given position the connecting rod reciprocates along a path which engages the actuating device, and that during oscillation of the lever away from the given position the connecting rod is diverted to move past the actuating device.

4,190,216
NARROW GAUGE FILM CASSETTE

Achim Kluczynski, Immekeppel, and Johannes Tabel, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,276
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623942
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—194 9 Claims



1. A cassette containing a spool for carrying and feeding a film from one position to another within the cassette and having a plurality of parts being adapted to be repeatedly disassembled and reassembled to form a light-tight container comprising

a first casing having an open end, a film aperture in a casing wall diametric to the open end, and a first and second major casing walls each normal to the apertured wall, said major walls spaced apart and diametric to each other and forming with the apertured wall a chamber accessible through said open end,

the first major wall having a first opening centrally positioned for receiving a film spool and the second major wall having a second opening centrally positioned and diametric to said first opening,

a frusto-conical surface around said second opening in said second major wall extending into said chamber,

a second casing having wall members engageable with the walls of the first casing and means formed in the walls of the first and second casings to provide light-tight junctions between the first and second casings,

a film feed spool having a fixed core and a take-up core positioned within the second casing, said take-up core being rotatably positioned with respect to the fixed core and provided with means for providing rotation,

a fastening member positionable within the cassette comprised of

a center post positionable on said frusto-conical surface, said center post having a central passage extending axially through the post; and

a pin capable of being fastened in the central passage and adapted to both engage the outer surface of the second major wall of the first casing,

said pin extending through the central passage and engaging the film spool,

whereby the film spool is engaged into a light-tight relationship with the inner surface of the first major wall of the first casing.

4,190,217
FILTER SYSTEM FOR AGRICULTURAL AIRCRAFT

William M. O'Connor, Westport, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Dec. 5, 1977, Ser. No. 857,218
Int. Cl.[2] B64B *1/24*
U.S. Cl. 244—53 B 1 Claim

1. Apparatus for filtering the inlet airflow of a gas turbine engine said engine being mounted in the aerodynamically shaped nose portion of an agricultural aircraft comprising:

a housing constructed in the nose portion and formed to enclose and support the gas turbine engine;

a duct constructed in the housing;

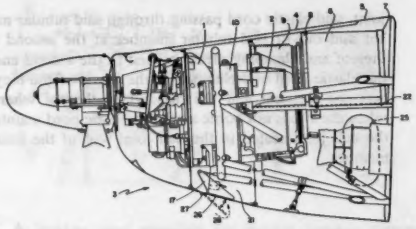
a first inlet opening constructed in the upper portion of the nose portion and having a low aerodynamic impedance to air flowing over the nose portion said inlet connected to the duct to allow the flow of air thereto;

a cylindrical automotive type barrier filter assembly mounted in the duct with its longitudinal axis transverse to the airflow, said airflow flowing through the filter in a radial manner; said filter assembly comprising:

a perforated cylindrical member which is closed at one end to form a receptacle;

a perforated shroud mounted within and spaced radially from the cylindrical member to form an annular space within the receptacle, said shroud having an axially extending inner passage formed concentric with the axis of the cylindrical member to collect the radially flowing filtered air;

an annular barrier filter element removably secured within



the annular space in the receptacle and constructed to allow the radial flow of air;

a closure adapted to removably fit over the open end of the receptacle to retain the filter element, said closure having a concentric opening communicating with the inner passage;

a connecting duct connected to the filter passage and communicating directly with the inlet of the engine to form a sealed passage from the filter to the gas turbine engine;

a bulkhead mounted in the housing to substantially surround the filter assembly and thermally insulate said assembly from the gas turbine engine;

a bypass duct connected to the inlet of the gas turbine engine and constructed to allow the flow of air directly to the engine; and

a second inlet constructed in the nose portion and connected to the bypass duct, said second inlet having means to open said inlet and allow the flow of air into the bypass duct in the event that the filter becomes clogged.

4,190,218
BIKE KITE

Michael Cousens, Jr., 1350 NW. 45th St., Miami, Fla. 33142

Filed Nov. 13, 1978, Ser. No. 960,231
Int. Cl.[2] A63H *27/08*; B64C *31/06*
U.S. Cl. 244—155 R 1 Claim

1. A bike kite flown from a bicycle during movement of said bicycle, said bicycle having a frame with a seat-supporting part and a rear wheel supporting part, a seat mounted on the seat-supporting part and a rear wheel rotatably mounted in the rear wheel supporting part, said bike kite comprising

a kite having a harness;

a ball joint affixed to the harness of the kite;

a kite string having spaced opposite first and second ends, said kite string being tied at its first end to the ball joint on the harness of the kite; and

kite tethering means affixed to the frame of the bicycle for affixing the second end of the string to the bicycle, said kite tethering means comprising an elastic cord having a first end affixed to the second end of the kite string and a spaced opposite second end, a tubular member having spaced opposite first and second ends with a ball joint seat formed in the first end thereof for accommodating the ball

joint, said elastic cord passing through said tubular member and out of said tubular member at the second end thereof and clamping means affixed to the second end of the elastic cord and clamped to the frame of the bicycle between the seat and the rear wheel thereof whereby when the kite is not borne aloft, the elastic cord maintains the ball joint seated in the ball joint seat of the tubular member.

4,190,219

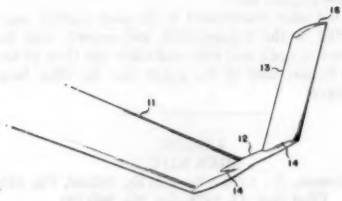
VORTEX DIFFUSER

James E. Hackett, Smyrna, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed May 17, 1977, Ser. No. 797,788

Int. Cl.[2] B64C *5/08*

U.S. Cl. 244—199 **5 Claims**



1. A vortex diffuser to attenuate vortex flow after its formation and emanation from an airplane wing, such diffuser consisting of an aerodynamically configured boom secured to and extending aftwardly from said wing adjacent the outer tip thereof, and a single asymmetric vane secured to one side of said boom adjacent the aft end thereof and located entirely aft of said wing, said vane extending upward from said one side of said boom in a generally vertical direction and disposed in the path of said vortex flow, being cambered toward its leading edge so as to intercept said vortex flow smoothly and prevent the separation thereof.

4,190,220

METHOD AND APPARATUS FOR BRAKING RAIL-GUIDED VEHICLES AUTOMATICALLY AND ACCURATELY WITH RESPECT TO A DECELERATION DISTANCE

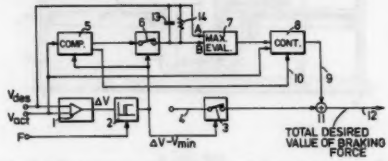
Karl Hahn; Herbert Bohms, both of Berlin; Johannes Strecker, Feldafing, and Wilhelm Landes, Neusass-Westheim, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,457

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2708361

Int. Cl.[2] B61L *3/00*

U.S. Cl. 246—182 B **7 Claims**



1. A method of braking a rail vehicle from a first speed to a target speed in a predetermined distance, said method comprising the steps of: generating a predetermined, fixed braking force upon actuation of a vehicle brake, generating a first, fixed braking force signal that has an amplitude corresponding to said braking force; generating a second signal corresponding to the actual speed of said vehicle; delaying said second signal for a first delay time; generating a third signal corresponding to reference speed values, said third signal having an initial maximum value corresponding to the delayed value of the signal corresponding to the actual speed of said vehicle at the time the brake is applied; generating, after a predetermined second delay time, a correcting braking force to modify the rate of change of speed of said vehicle to reach said target speed within said distance; combining said correcting braking force with said predetermined, fixed braking forces after said second delay time; removing said predetermined, fixed braking force when said vehicle slows down to a speed that differs from said target speed by a predetermined amount; thereupon generating a new correcting braking force based on the target speed; and applying said new braking force to brake said vehicle to said target speed.

4,190,221

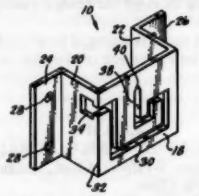
SECURITY MOUNTING

Peter E. Updike, 3949 Olive Ave., Long Beach, Calif. 90807

Filed May 18, 1978, Ser. No. 906,959

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—551 **6 Claims**



1. A security mounting of the type for reversibly attaching a movable component to a stationary component which comprises:

a pin means having an enlarged head;

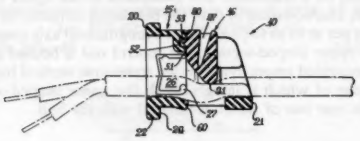
said pin means attached to one of said movable or stationary components;
a bracket member;
said bracket member including attaching means;
said attaching means attaching said bracket member to the other of said movable or stationary component;
said bracket member including a face plate;
said face plate having a tortuous channel winding through said face plate;
said tortuous channel having a dimension across its width intermediate the diameter of said pin means and the dimension of said enlarged head;
said tortuous channel including a first branch having an opening allowing said pin means to be inserted into said tortuous channel, a terminus branch at the opposite end of said tortuous channel from said first branch and a plurality of other branches located between said first branch and said terminus branch, the configuration of which forms a maze such that said pin means is inserted in said opening, and said pin means is slid along said tortuous channel until said pin means rests in said terminus branch attaching said movable component to said stationary component.

4,190,222

ELECTRICAL CABLE CONNECTOR WITH CAM LOCK

Arthur I. Appleton, Indian Creek Village, Fla.; Jon L. Liljequist, Mount Prospect, and Carlos J. Ylagan, Glendale Heights, both of Ill., assignors to Appleton Electric Company, Chicago, Ill.

Filed Feb. 21, 1978, Ser. No. 879,347
Int. Cl.² F16L *5/00*
U.S. Cl. 248—56 **4 Claims**



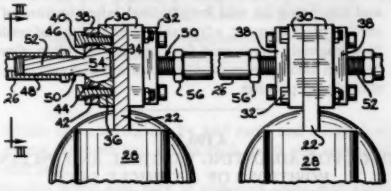
1. An electrical cable connector for fixedly securing at least one electrical conductor to an electrical box and for providing a protected pathway into the inside of the box through an opening therein, comprising:
a tubular main body having an inner end and an outer end, said tubular body being of lesser diameter than said opening over most of its length including its outer end to permit most of said main body from outer end to inner end to pass through said opening from the interior to the exterior of the box,
a passageway extending axially through said body for protectively channeling said conductor into said box,
flange means on said body proximate its inner end extending sufficiently radially outwardly from said tubular body to engage the inside of said box around said opening for preventing said tubular body from freely passing entirely through said opening from the interior of the box to the exterior of the box,
locking means between said flange means and said outer end for holding said flange adjacent said opening,
and separate and movable compression means interfitting with said tubular body between said locking means and said outer end for fixedly clamping said conductor to said connector, said compression means being contained entirely within said lesser diameter to permit passage thereof through said box opening during installation of said connector into said box said compression means including a cam having an axis extending transversely of said passageway and journalled in said tubular body, said cam being rotatable between a first position, wherein said passageway is unobstructed to passage of said conductor therethrough, and a second position at least partially blocking said passageway, whereupon movement of the cam from its first position to its second position when the conductor is in the passageway effects a clamping of the conductor to the connector,
said compression means also including slot means therein for receiving the slender end of an elongate implement to facilitate moving it from its first position to its second position, said slot extending into said cam in a direction transverse of said axis so that the length of said implement can be utilized to exert a considerable turning effort thereon.

4,190,223

BRACING STRUT FOR FLEXIBLE CONDUITS

Kenneth R. Swanson, Lawrence, and Richard J. Beilfuss, Baldwin City, both of Kans., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 27, 1978, Ser. No. 881,594
Int. Cl.² E04G *25/06*; F16M *13/00*
U.S. Cl. 248—68 R **1 Claim**



1. A bracing strut assembly for flexible conduit systems comprising, in combination, a flange support bracket having opposite sides and fixed to the conduit to be braced, a pair of spaced planar flange supports, first threaded fasteners mounting a flange support on each side of said bracket, a pair of planar flanges, second threaded fasteners mounting each flange upon a flange support, a ball socket defined by a semi-spherical recess formed in each of said associated flange supports and flanges, an opening defined in each flange communicating with the associated socket, a rigid bar having opposite ends, a bore defined on each end of said bar, threads defined in each bore, the thread pitch within said bores being of opposite hand, and a ball having a threaded stem rotatably mounted in each bar end bore extending through a flange opening and a spherical head received within a socket, the transverse dimension of said openings being greater than the transverse dimension of said stems permitting oscillation of said heads within the associated socket.

4,190,224

INTRAVENOUS POLE HOLDER

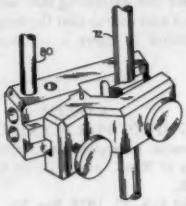
Gerald J. LeBlanc, and Edgar J. LeBlanc, both of 73 Pond St. (R), Natick, Mass. 01760

Continuation of Ser. No. 790,595, Apr. 25, 1977. This application Jun. 14, 1978, Ser. No. 915,468
Int. Cl.² F16M *13/00*
U.S. Cl. 248—229 **3 Claims**

1. An improved clamping device for a substrate which comprises:
(a) a pair of substantially parallel first and second plate elements adapted to conform to said substrate, arranged in a substantially parallel arrangement to permit the plate elements to move between an expanded open position whereby the substrate to be clamped may be placed between first and second plate elements, and a contractable closed position whereby the substrate is secured and compressed between the closed plate elements;
(b) the said first plate element defining a channel running from one end thereof part way along the direction thereof;
(c) said second plate element defining a longitudinal raised

section running from an end thereof part way along the longitudinal direction, adapting to said longitudinal groove of said first plate element when said clamping device is in said open expandable open position;

(d) pin means joining said first plate element to said second plate element;



(e) screw means threadingly engaging said first plate element and impinging on said longitudinal raised section of said second plate element, adjustable over a range of positions to engagingly move said first and second plate elements between said open expandable position and said contractable closed position.

4,190,225

DEVICE FOR ADJUSTING VERTICAL AND INCLINED POSITIONS OF A VEHICLE SEAT

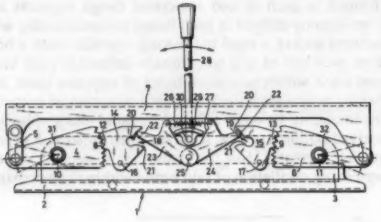
Heinz Bauer; Burckhard Becker, and Alfred Gedig, all of Solingen, Fed. Rep. of Germany, assignors to C Rob Hammerstein GmbH, Solingen-Merscheid, Fed. Rep. of Germany

Filed Mar. 14, 1979, Ser. No. 20,632

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811582

Int. Cl.² F16M *11/24, 13/00*

U.S. Cl. 248—394 **9 Claims**



1. In a device for adjusting vertical and inclined positions of a vehicle seat, including at each lateral side of the seat a five-bar linkage assembled of an underframe, a seat carrier bar, a pair of support levers pivotably connected to the underframe, a coupling bar linked between one of the support levers and an end portion of the carrier bar, the other end portion of the carrier bar being linked to the other support lever, a combination comprising a gear segment formed on each of said support levers; a pair of arresting levers linked to the underframe and each being provided with arresting teeth engageable with said gear segments; switching levers linked to said underframe between said arresting levers; spring means coupled to said switching levers for urging the same against said arresting levers to bring the arresting teeth thereof into engagement with said gear segments; a control lever pivotably connected to said underframe between said switching levers; and a cam rigidly connected to said control lever and operable to rotate a selected switching lever against the force of said spring means and out of contact with said arresting levers, thus disengaging the arresting teeth from the corresponding gear segment.

4,190,226

VEHICLE SEAT SLIDES

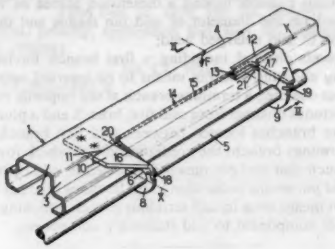
Alain Letournoux, St. Jean de Blanc, and René Droual, Ris Orangis, both of France, assignors to Societe Industrielle Bertrand Faure, Etampes, France

Filed Oct. 3, 1978, Ser. No. 948,303

Claims priority, application France, Oct. 19, 1977, 77 31474

Int. Cl.² F16M *13/00*

U.S. Cl. 248—429 **6 Claims**



1. A vehicle seat slide comprising a lower shaped-section intended to be fixed to the floor of the vehicle, an upper shaped-section intended to be fixed to the seat and adapted to slide along the lower shaped-section, a bolt mounted on the upper shaped-section and adapted to coact with a rack integral with the lower shaped-section, and a rigid rod for controlling the movements of the bolt against the return force of a spring, said rod extending along the slide and being itself pivotably mounted on a transverse axis connected to the upper shaped section, characterized in that, the bolt being mounted in a way known per se so as to pivot about a longitudinal axis connected to the upper shaped-section, the control rod is housed in two holes provided respectively in two transverse vertical lugs, the front one of which is integral with the upper shaped-section and the rear one of which is integral with the bolt.

4,190,227

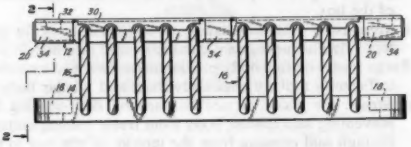
VIBRATION ISOLATOR AND METHOD FOR MANUFACTURING SAME

Robert E. Belfield, Sayville; Chester L. Gilbert, Forest Hills, and Euland M. Bickham, North Babylon, all of N.Y., assignors to Aeroflex Laboratories, Inc., Plainview, N.Y.

Filed Jul. 22, 1976, Ser. No. 707,589

Int. Cl.² F16L *15/04*

U.S. Cl. 248—636 **19 Claims**



1. In an isolator for supporting a load on a part, such as a vehicle part, which is subject to vibrations, in a manner insulating the load from the vibrations, a pair of elongated substantially coextensive bar means of substantially the same size and configuration respectively situated in alignment with each other and respectively being spaced from each other while being situated in substantial parallel planes, one of said bar means being adapted to be connected with the load while the other of said bar means is adapted to be connected with the part which is subject to vibrations, and a plurality of elongated spring means portions distributed longitudinally along each side of said pair of bar means and being fixed thereto, said plurality of spring means portions respectively being situated substantially in parallel planes which are substantially normal

to the parallel planes in which said pair of bar means are located, each said spring means portion extending between said bar means along a path at least a portion of which is curved, one spring means portion on each side of said bar means being aligned in the same plane, each pair of spring means portions aligned in a single plane being integral with each other and formed from a single spring member, each of said spring members having an intermediate portion fixed to one of said bar means and a pair of ends fixed to the other of said bar means, said plurality of spring members interconnecting said pair of bar means for yieldable springy movement of one bar means with respect to the other, said intermediate portion of each spring member being situated substantially midway along the length thereof so that both of said spring means portions formed therefrom are substantially identical, both of said bar means being made of a molded material, said intermediate portions of said spring members being embedded in said one bar means during molding while said ends of each spring member are embedded in the other of said bar means during molding, said other bar means including a pair of separate elongated molded bodies in which said ends of each spring member are respectively embedded, said plastic bodies being situated in side-by-side relation and extending longitudinally of each other, and said other bar means including a retainer means operatively connected with said pair of molded bodies for retaining them connected to each other in side-by-side relation.

4,190,228

MOULD FOR THE METALLOTHERMIC WELDING OF METAL ITEMS

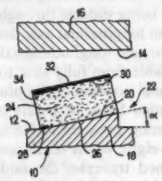
Patrick Bommart, Rueil Malmaison, France, assignor to C. Delachaux, Gennevilliers, France

Filed Jul. 5, 1978, Ser. No. 922,035

Claims priority, application France, Jun. 7, 1978, 77 21158

Int. Cl.[2] B22D *19/04;* B23K *23/00*

U.S. Cl. 249—86 **11 Claims**



1. A mould comprising at least two parts for the metallothermic welding of at least two metal items together by arrangement around butts of each of the metal items to define a pouring cavity adapted in use to receive hot welding-fluid, a face of the mould which in use will contact a part of one of the items to be welded or another portion of the mould, said face having a projection limiting the mould cavity and which in use presents a sloping side towards the exterior of the pouring cavity, and a strip of a compressible material which is little affected by heat being fixedly attached to the sloping side of the projection in order to abut said part of one of the items or the other portion of the mould and thereby automatically ensuring staunching of the mould after positioning the parts thereof around butts of the metal items.

4,190,229

HOT DOG BUN PAN

David R. Bradshaw, P.O. Box 1364, Selma, Ala. 36701

Filed Jan. 26, 1978, Ser. No. 872,623

Int. Cl.[2] A21C *11/00*

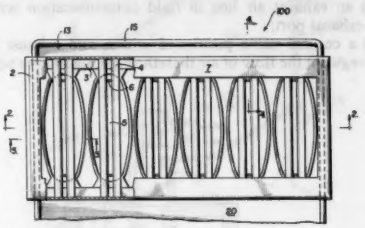
U.S. Cl. 249—124 **3 Claims**

1. A pan assembly for fabricating hot dog buns having a recess to accommodate a complimentally formed hot dog comprising:

a rectangular tray having a flat bottom panel, vertically upstanding walls contiguous therewith extending around said bottom panel,

a holding rack having a first pair of opposed parallel edges with a length longer than a one dimension of said bottom panel whereby said first pair of edges extend over two of the upstanding walls of said tray to form two lips for removing said rack from said tray,

said rack having a second pair of opposed parallel edges thereby forming a substantially rectangular frame with said first pair of edges, said second pair of edges defined by a lower portion and a longer upper portion parallel thereto and spaced therefrom, p1 plural molds disposed



within and constrained by said rack, and recess forming means disposed one within each mold and supported by said rack,

whereby when said rack is removed from said tray said recess forming means is carried therewith and said mold is left behind,

in which said molds are defined by a generally ovaloid configuration having open top and bottom faces and are provided with plural tab members extending horizontally outwardly from the longitudinal extent of said oval mold at the top face thereof and said tab members abut against said lower portion of said second pair of edges of said rack so as to constrain said mold in said tray.

4,190,230

SCAVENGING AIR VALVE FOR CLEANING TUBULAR AIR FILTER BODIES

Hans Geissbühler, Niederuzwil, Switzerland, assignor to Gebrueder Buehler AG, Switzerland

Continuation of Ser. No. 682,844, May 4, 1976, abandoned. This application Mar. 10, 1978, Ser. No. 885,166

Claims priority, application Switzerland, May 5, 1975, 5783/75

Int. Cl.[2] F16K *31/122*

U.S. Cl. 251—36 **7 Claims**

1. A high speed low pressure scavenging air valve for cleaning at least one tubular filter body by selectively introducing pulses of scavenging air from a scavenging air chamber to said tubular body comprising:

(a) a housing having stationary inner side walls, a stationary end wall connected to said side walls, and an exhaust port through said end wall, a maintaining chamber being defined between said inner walls and said end wall;

(b) a scavenging air line having an inlet end disposed within said maintaining chamber, said inlet end having a first transverse dimension;

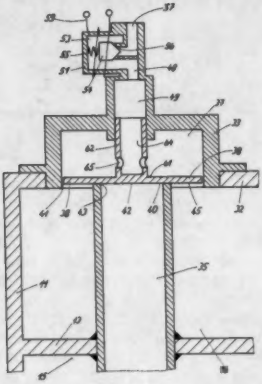
(c) a valve disc formed of rigid material having first and second sides, and a central portion, said first side being exposed to said scavenging air chamber, said second side being exposed to said maintaining chamber, said central portion being disposed to selectively open and close said inlet end of said scavenging air line, said first and second sides extending substantially beyond the first transverse dimension of said inlet end of said air line to provide a pressure surface on the first side of said disc for said scav-

enging air to move said disc away from said inlet end, said disc being mounted for reciprocating movement within said maintaining chamber in a direction normal to said disc, said second side forming a second pressure surface opposite said stationary end wall for scavenging air in said maintaining chamber to move said disc toward said inlet end, said first and second sides having outer edge portions, said outer edge portions and said inner side wall of said maintaining chamber defining a narrow throttling passageway which provides fluid communication between said scavenging air chamber and said maintaining chamber;

(d) means for guiding said disc in said maintaining chamber;

(e) an exhaust air line in fluid communication with said exhaust port;

(f) a control valve positioned within said exhaust line to regulate the flow of air therethrough, said valve normally



blocking the flow of air whereby said disc is normally biased to close said inlet end by the pressure of scavenging air within said maintaining chamber on the second pressure surface of said second side, and whereby when said control valve is open, said pressure in said maintaining chamber is released and said scavenging air pressure acting against said first side of said disc rapidly opens said inlet end of said scavenging air line introducing a scavenging air pulse into said air line; and

(g) means for pneumatically damping said disc in its movement toward said end wall to open said inlet end whereby said disc rapidly closes said inlet end to terminate said scavenging air pulse, said pneumatic damping means being inoperative to dampen said disc movement upon initial rapid opening of said air inlet end and operative to dampen said disc movement only as said disc approaches said end wall of said maintaining chamber.

4,190,231

BILATERALLY BALANCED FLUID CONTROL VALVE

Ettore Vimercati, 42 Via F. Carridoni, Bergamo, Italy

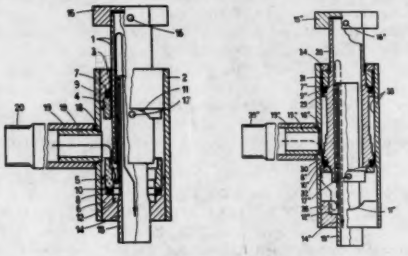
Continuation-in-part of Ser. No. 811,858, Jun. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 566,071, Apr. 8, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,229

Claims priority, application Italy, May 21, 1974, 22998 A/74

Int. Cl.[2] F16K *47/00*

U.S. Cl. 251—118 **2 Claims**

1. A valve for controlling and shutting off the flow of fluid from a pipe, in which the shutting and control elements are two separate components, one of said components being tubular in shape and positioned inside the other hollow component, the said hollow component being the body of the valve carried by a pipe inserted into the fluid-supply pipe, and the said tubular component being the plunger of the valve, elastic sealing rings being disposed in recesses provided in the cylindrical surfaces of coaxially permanently fitted sleeves disposed inside the valve body, the said sealing rings rubbing and pressing lightly against the smooth cylindrical surface of the plunger facing them, small closed circular areas being the contact regions of the elastic sealing rings on the smooth cylindrical surface within the confines of which the fluid inlet in the valve body is constantly disposed, the cylindrical surface of the top sleeve serving to guide the plunger, the cylindrical surface portion of the bottom sleeve located above the elastic sealing ring having a number of adjacent stepped portions whose diameters are only slightly different from that of the opposite smooth cylindrical surface serving as a fluid control, a cavity being part of the valve body and located beneath the bottom sealing ring serving as a chamber for the dissipation of such kinetic energy as is generated by the fast-flowing fluid collid-



ing with the slow-flowing fluid where the fluid discharge is located, the said fluid discharge means being tubular in shape and aligned with the valve body, and being fitted into a bore provided in the bottom wall of the cavity, and serving to remove turbulence from the outflowing stream of fluid, the said plunger of the valve being slidable through the said sealing rings along their common longitudinal axis, and being furthermore rotatable around the said longitudinal axis, the fluid flow being gradually controllable from fully shut to fully open as a function of the longitudinal position of the plunger relative to the valve body, the plunger being in a state of static balance with respect to any existing pressure and friction as well as with respect to its own weight, whatever its position within the limits of its predetermined traverse, the said plunger being displaceable from its position of rest under guided conditions and solely under the direct control of an operator.

4,190,232

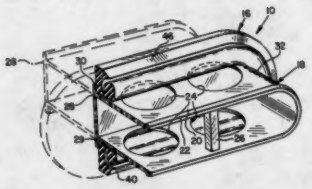
IRRIGATION PIPE GATE VALVE

Lloyd W. Clements, 49 W Lincoln Ave. (C), Woodland, Calif. 95695

Continuation-in-part of Ser. No. 918,492, Jun. 23, 1978, abandoned, which is a continuation of Ser. No. 775,244, Mar. 7, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 964,264

Int. Cl.[2] F16K *31/58*

U.S. Cl. 251—145 **8 Claims**



5. In an irrigation structure including a generally horizontal irrigation pipe having a generally elliptical opening disposed so

that the major axis of the ellipse extends lengthwise of the pipe, the improvement comprising a gate valve including:

a substantially rigid, generally elliptical tubular slide having shorter side portions and longer side portions, an open outer end and a closed inner end and a plurality of generally circular openings in each of the longer side portions thereof,

the openings in one of the longer side portions being substantially directly opposed to the openings in the other of the longer side portions,

the shorter side portions being imperforate,

and a generally elliptical sealing frame of elastomeric material mounted in the opening in the pipe and fitting closely on the slide and having an exterior circumferential groove

the slide being adjustable axially relative to the frame and the slide and the frame being provided with detent portions to hold the slide in adjusted position relative to the frame.

4,190,233

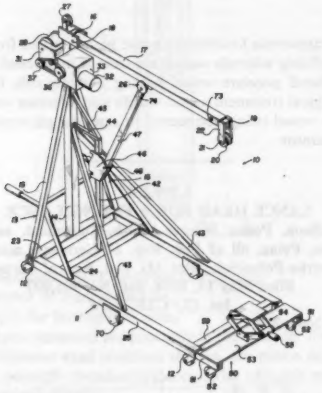
JACK

Charles J. B. Godfrey, 334 Reid St., Forest City, N.C. 28043

Filed Jun. 30, 1978, Ser. No. 921,054

Int. Cl.² B66F *3/46*

U.S. Cl. 254—4 B **8 Claims**



1. A jack comprising a base frame defined by a first pair of horizontally disposed spaced parallel hollow beams interconnected at one end by a pair of cross pieces, and at another end by a further cross piece, a second pair of horizontally disposed spaced parallel beams telescopingly inserted within said first pair of beams at said further cross piece, said second pair of beams interconnected by a platform upon which first jack means are affixed, wheel underlying and supporting said beams, a vertical frame carried by said base at the extremity thereof remote from said first jack means, said vertical frame comprising a vertical post joined to a central portion of one cross piece having plural angled braces extending from said first pair of spaced hollow beams to said vertical post, an overhead boom hinged at one extremity thereof to a top portion of said vertical post, said boom extending over said first pair of hollow beams, and means for pivoting said boom about said vertical post.

4,190,234

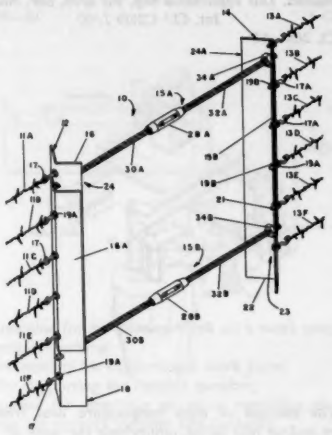
MULTIPLE WIRE FENCE TIGHTENER

Cecil L. Coleman, Rte. 1, Box 246, Dardanelle, Ark. 72834

Filed Oct. 24, 1978, Ser. No. 911,899

Int. Cl.² B66F *3/00*

U.S. Cl. 254—83 **1 Claim**



1. A multiple wire stretcher for tightening fences, said stretcher comprising:

first and second elongated, rigid pulling angle members adapted to be disposed in parallel, spaced apart relation said pulling angle members each having top and bottom portions; said angle members comprising angled elongated reinforcement members rigidly coupled thereto and extending between said pulling angle member top and bottom portions for preventing deformation of said pulling angle members during operation of said wire stretcher;

a first adjusting rod adapted to extend between said pulling angle member top portions, said first adjusting rod threadably coupled to each said pulling angle members whereby rotation of said rod draws said pulling angle members together;

a second adjusting rod adapted to extend between said pulling angle member bottom portions, said second adjusting rod threadably coupled to said pulling angle members whereby rotation of said second adjusting rod draws said pulling angle members together;

said first and second adjusting rods each comprising:

a centrally disposed turnbuckle portion adapted to be manually rotated to operate said wire stretcher;

an elongated, lefthand threaded segment weldably secured to said turnbuckle portion and threadably received within one of said first and second pulling angle members; and

an elongated, righthand threaded segment weldably secured to an opposite side of said turnbuckle portion and threadably received within the other of said first and second pulling angle members;

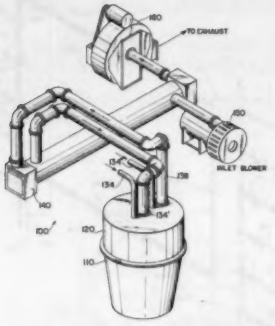
said pulling angle members additionally comprising apex portions thereof comprising nut means weldably secured thereto at a central, symmetrical position for threadably receiving said lefthanded and right-handed threaded adjusting rod segments, thereby preventing twisting of said elongated pulling angle members in response to rotation of said adjusting rods; and

a plurality of eye bolts adapted to be coupled to individual wire elements of said fence and secured to said pulling angle members in spaced apart relationship thereon.

4,190,235
FLUIDIZED BED LADLE HEATING METHOD AND APPARATUS

William C. Dell, 1211 Connecticut Ave., NW., Washington, D.C. 20036

Continuation-in-part of Ser. No. 933,834, Aug. 15, 1978, abandoned. This application Sep. 14, 1978, Ser. No. 942,366
Int. Cl.[2] C21D 1/00
U.S. Cl. 266—44 36 Claims

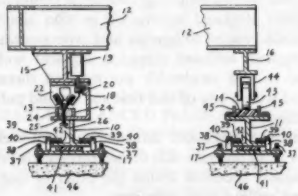


1. The method of high temperature heat treatment of foundry and/or mill ladles, comprising the steps of:
(A) pneumatically forming within a given ladle, a fluidized bed of refractory particles, capable of containing and sustaining high temperatures up to at least 2000° F.;
(B) heating the fluidized bed internally by injecting combustion gases therein to raise the temperature of the ladle to a range of not less than 800° F.;
(C) simultaneously with step (B) exhausting heating gases from the fluidized bed while;
(D) controlling the input of (B) with the exhaust of (C) to form a controlled zone of negative pressure above the fluidized bed.

4,190,236
APPARATUS FOR GUIDING A TOOL IN A LINEAR PATH RELATIVE TO A WORK PIECE, AND METHOD OF MANUFACTURE THEREOF

John R. McKibbin, and Frederick B. Tyler, Jr., both of P. O. Box 58002, Birmingham, Ala. 35209

Filed Mar. 23, 1979, Ser. No. 23,242
Int. Cl.[2] B23K 7/10
U.S. Cl. 266—69 20 Claims

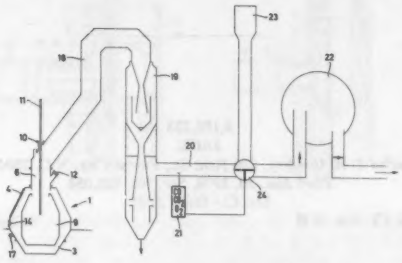


1. An improvement in an apparatus for guiding a tool in a linear path relative to a work piece, including a means for supporting said work piece, a first linear track member, a second collinear track member laterally displaced from said first linear track member, a transverse member movably supported by said first linear track member and said second collinear track member, and a tool carried by said movable transverse member, wherein the improvement comprises:
(a) A means for maintaining perpendicularity between said first linear track member and said transverse member;
(b) A means for providing rolling support for said transverse member by said second collinear track member; and
(c) A second collinear track member having a horizontal epoxy supportive surface made from a liquid epoxy material hardened into a horizontal supportive surface, said horizontal epoxy supportive surface being in communication with said means for providing rolling support for said transverse member by said second collinear track member.

4,190,237
APPARATUS FOR TREATING REFINERY WASTE GASES

Jörg P. Baum, Essen, Fed. Rep. of Germany, assignor to Verfahrenstechnik Dr. Ing. Kurt Baum, Essen, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,896
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714825
Int. Cl.[2] C21C 5/40
U.S. Cl. 266—80 11 Claims

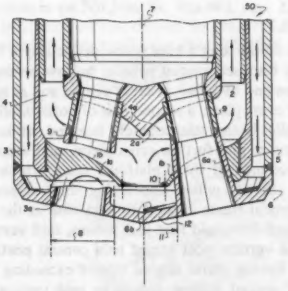


1. An apparatus for treating waste gases emitted from metallurgic refining wherein metals are treated in a vessel comprising a closed pressure vessel having a removable bottom, a metallurgical treatment vessel within said pressure vessel, said pressure vessel being connected to a waste gas cooler and a dust separator.

4,190,238
LANCE HEAD FOR A FINING LANCE

Josef Schoop, Peine; Werner Resch, Dortmund, and Heinz Damme, Peine, all of Fed. Rep. of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 905,007
Int. Cl.[2] C21C 5/48
U.S. Cl. 266—270 9 Claims



1. A lance head for a refining lance, comprising, a lance head bottom member, a plurality of nozzles connected to said bottom member, a supply line connected to said bottom member

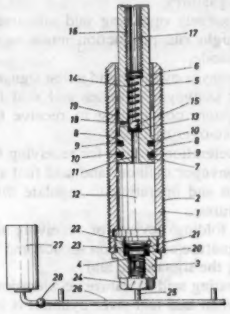
for supplying coolant toward an inner surface thereof, a return line connected to said supply line for channeling coolant away from the interior surface of said bottom member, said supply and return lines disposed concentrically of a major axis of said lance head, a flow guide member connected between said supply line and said return line extending inwardly toward the major axis of said lance head and closely around said nozzles for directing coolant toward and across said bottom member interior surface, said flow guide member having a bottom surface facing said bottom member interior surface and defining a first coolant passage therewith, said flow guide member bottom surface being concave toward said interior surface in the area adjacent said nozzles and the cross-sectional area of said first coolant passage being substantially constant past said nozzles due to said concavity, whereby, coolant is uniformly directed past said bottom member interior surface.

4,190,239

SHOCK ABSORBER ASSEMBLY AND INSTALLATION

Gerhard Schwankhart, Attnang-Puchheim, Austria, assignor to Walter Sticht, Attnang-Puchheim, Austria

Filed Jun. 8, 1978, Ser. No. 914,617
Claims priority, application Austria, Jun. 17, 1977, 4283/77
Int. Cl.² F16F *9/19*
U.S. Cl. 267—65 R **7 Claims**



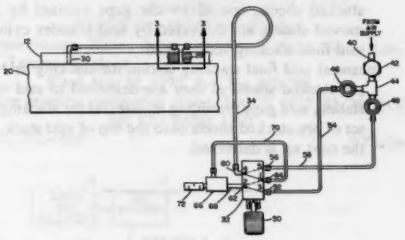
1. A pneumatic shock absorber comprising
(a) a source of compressed air,
(b) a cylinder having two ends,
(c) a piston mounted reciprocably in the cylinder for assuming different axial positions therein, the piston defining
(1) a pressure chamber in the cylinder adjacent one of the cylinder ends,
(d) inlet passage means communicating with the pressure chamber,
(e) conduit means premanently connecting the compressed air source to the inlet passage means for delivering compressed air to the pressure chamber for reciprocation of the piston,
(f) a check valve in the inlet passage means and responsive to an air pressure in the pressure chamber exceeding the pressure of the compressed air for preventing the escape of compressed air from the pressure chamber,
(g) an outlet passage means connected to the atmosphere and communicating with the pressure chamber in any of the axial positions of the piston, and
(h) an adjustable relief valve in the outlet passage and responsive to a pressure in the pressure chamber to which the relief valve is adjusted for venting the said pressure to the atmosphere.

4,190,240

CYLINDER HEAD SUPPORT WITH AIR CUSHION AND VACUUM HOLD DOWN

Bertil G. Peterson, Bloomington, Minn., assignor to Tobin-Arp Manufacturing Company, Eden Prairie, Minn.

Filed Apr. 17, 1978, Ser. No. 896,889
Int. Cl.² B25B *11/00*
U.S. Cl. 269—21 **5 Claims**



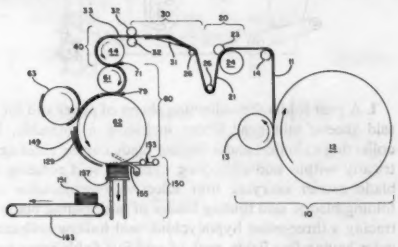
1. In a machine for performing work on a work piece, the improvement comprising:
a support member for supporting a work piece;
a table for supporting the support member;
orifice means for supplying air to or removing air from between the support member and the table;
an air source;
a vacuum force transducer having an air supply inlet, a vacuum inlet, and an exhaust outlet; and
operator-controlled valve means for selectively connecting the air source to the orifice means to provide an air cushion which permits positioning of the support member with respect to the table, or connecting the air source to the air supply inlet of the vacuum force transducer and the vacuum inlet to the orifice means to provide a vacuum which holds the support member in a fixed position with respect to the table.

4,190,241

APPARATUS FOR CONVERTING PAPER ROLLS INTO STACKS OF INDIVIDUAL FOLDED PAPER SHEETS

Gary A. Krueger, Neehah, Wis., assignor to Kimberly-Clark Corporation, Neehah, Wis.

Filed May 1, 1978, Ser. No. 901,436
Int. Cl.² B42C *1/04*
U.S. Cl. 270—47 **4 Claims**



1. In apparatus for converting a continuous paper web into stacks of individual web segments, the combination comprising:
a cutting station including a cutter for transversely segmenting said web into a continuous stream of adjacent sheets of regular length as said web is carried through said cutting station;
means including a rotary transfer cylinder for receiving said

stream of adjacent sheets and transferring said sheets from said cutting station to a final stacking station;

a rotary pre-stacker cylinder positioned parallel and tangent to said transfer cylinder for pre-stacking sets of sheets on said transfer cylinder before said sheets are delivered to said final stacking station, including means for removing certain sheets from said transfer cylinder, carrying them through 360° of rotation, and placing them upon remaining sheets on said transfer cylinder, whereby sets of pre-stacked sheets, spaced by the gaps vacated by the removed sheets, are delivered by said transfer cylinder to said final stacking station; and

means at said final stacking station for stacking said sets of pre-stacked sheets as they are delivered to said stacking station, said gaps providing an interval for stacking of one set of pre-stacked sheets onto the top of said stack, before the next set is delivered.

4,190,242

GEAR FOLDER

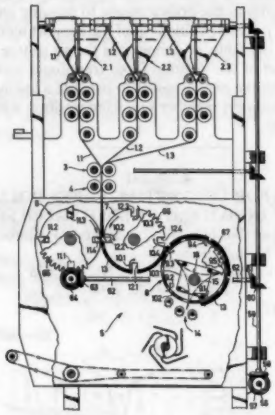
Hans B. Bolza-Schunemann, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 844,081

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652159

Int. Cl.² B42C *1/04*

U.S. Cl. 270—50 **4 Claims**



1. A gear folder for collecting sheets of paper and for folding said sheets, said gear folder including a rotatable, hollow, collecting cylinder, and a folding blade carrier rotating eccentrically within said collecting cylinder, said rotating folding blade carrier carrying four selectively projectable rotating folding blades, said folding blades of said folding blade carrier tracing a three-point hypocycloid, said hollow collecting cylinder having five fields, each of said five fields being equipped with a retractable pin set;

control means for selectively retracting each of said pin sets, said control means including a fixed cam disk having a first camming recess and a rotatable cam disk having a second camming recess, each of said pin sets being retracted only when said first and second camming recesses coincide, one revolution of said folding blade carrier coinciding with one 4/5 revolution of said collecting cylinder.

4,190,243

FOLDER ASSEMBLY FOR BOOK FOLDING

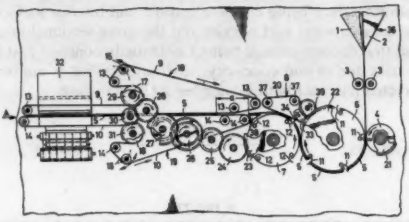
Horst B. Michalik, Hochberg, and Otto T. Weschenfelder, Wurzburg, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,637

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723358

Int. Cl.² B65H *45/22*

U.S. Cl. 270—66 **5 Claims**



1. A folder assembly for book folding in a web-fed rotary printing machine, said folding assembly folding signatures which have been severed from associated printed webs, said folder assembly comprising:

a rotatable cuttng knife cylinder and a rotatable take-over cylinder, said cutting knife cylinder severing the webs into a series of signatures;

means for selectively operating said take-over cylinder in either a straight run production mode or a collect run production mode;

a rotatable conveyor cylinder and a first signature conveyor system, said conveyor cylinder and said first signature conveyor system cooperating to receive the signatures from said take-over cylinder;

a signature acceleration section for receiving the signatures from said conveyor cylinder and said first signature conveyor system and operating to regulate the spacing between signatures;

a longitudinal folding device for receiving the signatures from said signature acceleration section and for longitudinally folding the signatures; and

means for operating said signature acceleration section at a first speed when said take-over cylinder is in the straight run production mode and at a second, different speed when said take-over cylinder is in the collect run production mode whereby said signature acceleration section delivers the signatures to said longitudinal folding device in a spaced array.

4,190,244

DEVICE FOR PICKING UP SHEETS FROM A MAGAZINE IN A PACKAGING MACHINE

Roberto Risi, Via Zampieri 11, Casalecchio di Reno (Province di Bologna), Italy

Filed Feb. 15, 1978, Ser. No. 878,129

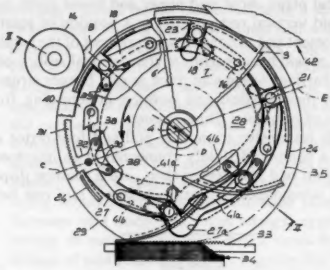
Claims priority, application Italy, Feb. 18, 1977, 3356 A/77

Int. Cl.² B65H *3/20*

U.S. Cl. 271—33 **2 Claims**

1. A device for picking up sheets from a sheet magazine comprising a base, a shaft journalled in said base at a given distance from the leading sheet in said magazine and driven with continuous motion, a plate member fixed to said shaft, a plurality of withdrawal sectors oscillating supported on said plate member and each comprising a cylindrical sheet holding segment having a radius of curvature equal to said given distance and a gear segment extending in the same plane of said cylindrical segment, a stationary rack fixed in the same plane as the leading sheet and so as to intermesh with said gear segment, cam control means formed in the base and extending around

said shaft and operatively associated with said sectors to pivot the latter, wherein according to the improvement the device further comprises a plurality of levers pivotally supported on said plate member and extending substantially circumferentially with respect to said shaft, each lever rotatably supporting



a respective sector and the axes of rotation of said sectors and levers being parallel to said shaft, stationary cam means being further provided controlling pivoting movement of said levers to produce, in cooperation with said cam control means, rolling of said cylindrical segments onto the leading sheet with said gear segment in intermeshing relationship with said rack.

4,190,245

DE-CURLING DEVICE FOR PRINTING PRESSES

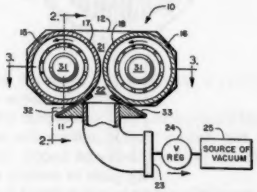
Harry Brandes, Hainburg, Fed. Rep. of Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 843,260

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648986

Int. Cl.² B65H *29/70*

U.S. Cl. 271—278 **2 Claims**



1. A sheet flattener for a sheet-fed printing press or the like in which printed sheets having a tendency to curl in the direction of a freshly printed surface thereof are conveyed seriatim edgewise from a source to a receiver along a path of flow comprising, in combination, a pair of elongated smoothly cylindrical rollers closely spaced parallel to one another to form a narrow gap between them and presenting opposed cylindrical surfaces defining an upper receiving space and a lower plenum space of cusp-shaped cross section, means including a supporting bar having end brackets for rotatively supporting the rollers crosswise with respect to the direction of sheet flow and for defining a receiving space closely spaced parallel to the sheet path, means including the supporting bar and end brackets for enclosing and sealing the plenum space, means for applying vacuum in the plenum space, means for conveying the sheets along the path of movement to the surface of said pair of closely spaced rollers with a freshly printed surface of each sheet in contact with the surface of said rollers, the surface of the rollers being continuous and imperforate so that the effect of the vacuum is concentrated in the gap at a sufficiently high level as to draw a conveyed sheet downwardly into the upper receiving space and deeply into the narrow portion of the gap and against the cylindrical surfaces in a cusped profile with the sheet undergoing an abrupt bend at the point of the cusp in a direction opposite to the direction of curling tendency thereby to remove the curl, both of the rollers being mounted for rotational movement at the speed of conveyance of the sheet to preclude any drag and relative slippage of the sheet against the surfaces thereby to insure against smearing of ink on the presented faces of the sheets.

4,190,246

PAPER FEEDING SYSTEM

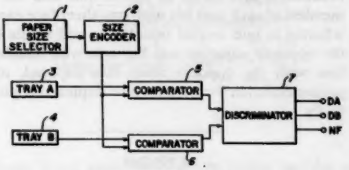
Kazuyasu Sasuga, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,301

Claims priority, application Japan, Jan. 27, 1977, 52/7913[U]

Int. Cl.² B65H *1/00*

U.S. Cl. 271—145 **1 Claim**



1. In a paper feeder for use in a copying machine equipped with a plurality of trays for storing paper of various sizes; the improvement comprising:

a circuit for encoding a selected paper size from a number of available paper sizes;

circuit means for detecting and encoding the sizes of paper stored in the plurality of trays;

a comparator circuit for comparing said selected paper size with one of the plurality of trays that contains paper corresponding to the selected paper size; and

a dual discriminator circuit for generating signals in response to the output of said comparator circuit, said discriminator circuit in a first mode enables paper feeding from a selected tray if paper is available for feeding and in a second mode generates a signal to indicate necessity of adding paper to the selected tray if the tray is empty.

4,190,247

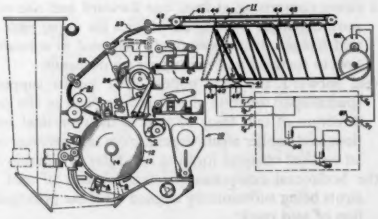
SHEET RECEIVING APPARATUS

Joachim Guenther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1974, Ser. No. 455,467

Int. Cl.² B65H *29/60*

U.S. Cl. 271—291 **2 Claims**



1. A multiple bin sheet receiving apparatus, for a reproducing machine conditionable to image on either one or both sides of a sheet, comprising:

a plurality of generally parallel bin side wall members each mounted to said apparatus independently pivotally suspended generally vertically from their upper ends at fixed,

spaced apart, positions to forms upper openings into said bins, and bin bottom members pivotally interconnecting the lower ends of all of said bin side wall members to define an integrally pivotable multiple sheet receiving bin apparatus with each bin side wall member being common to two adjacent bins,

means for transporting said sheets generally in a plane past said upper openings of said bins, including deflector means for deflecting sheets into said openings of said bins between said spaced fixed mounting positions of said bin side wall members, wherein said deflector means comprises two alternatively operated deflector members at each said bin opening, each adjacent to an opposite said bin side wall member,

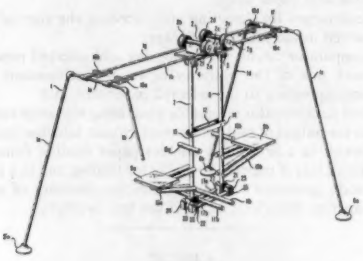
and means for automatically pivoting all of said bin side wall members in parallel as an integrally connected unit about said fixed upper end pivotal mountings thereof between first and second bin orientations, wherein in said first orientation said sheets lie against one said bin side wall member of each said bin with one sheet face exposed, and wherein in said second orientation said sheets lie against the opposite adjacent said bin side wall member of said bins with the opposite sheet face exposed, to provide proper collation for simplexed or duplexed copies, respectively.

4,190,248

TROLLEY-SWING

George J. Philippi, 1209 Stillman Ave., Plainfield, N.J. 07060

Filed Apr. 18, 1978, Ser. No. 897,332
Int. Cl.[2] A63F 7/06
U.S. Cl. 272—87 4 Claims



1. A trolley-swing comprising in combination:

a rigid frame constructed to support an elongated track at a height above and in substantially parallel relation to ground level;

a trolley, including a carriage, mounted for extended to and fro motion along said track;

a swing comprising at least one forward and one rear supporting hanger strut mounted with the upper ends of each said hanger strut respectively disposed in rotatable relation to forward and rear upper pivot means;

said forward and rear upper pivot means supported in spaced-apart relation along said carriage in the principal direction of said track so that in their vertical rest positions said hanger struts depend from said carriage in parallel vertical relation, forming two sides of a parallelogram;

the horizontal component of the rotation of said hanger struts being substantially aligned with the principal direction of said track;

interconnecting means being connected between the lower ends of said hanger struts through forward and rear lower pivot means, said interconnecting means forming a third side of said parallelogram which is substantially parallel to the carriage of said trolley;

at least one seat for a rider of said swing rigidly connected intermediate the end of at least one said hanger strut exclusive of said interconnecting means;

and means respectively responsive to manual pull and foot-thrust by a rider seated on said at least one seat for applying a torque to distort the angles of said parallelogram comprising said hanger struts, to cause rotation thereof in a vertical plane about said upper and lower pivot means, from said vertical rest position to a position of rotational displacement and to convert a component of the rotational motion of said hanger struts to translational motion of said trolley carriage along said track as said hanger struts pass through their vertical rest position in returning from a position of rotational displacement;

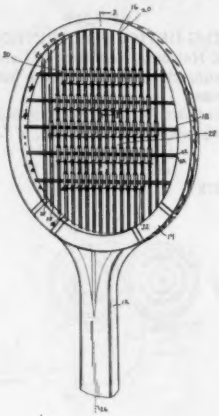
said means responsive to manual pull and foot-thrust comprising a hand-hold rigidly connected at an intermediate position on said one hanger strut, and a footrest disposed on said interconnecting means adjacent said one hanger strut.

4,190,249

TENNIS RACKET AND METHOD OF MAKING SAME

Werner Fischer, Lichtenburgerstrasse 13, 8113 Vilsbiburg, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,211
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634599; Jul. 31, 1976, 7624107[U]
Int. Cl.[2] A63B 51/06
U.S. Cl. 273—73 D 17 Claims



1. A tennis racket or the like which is particularly adapted for angular momentum transfer comprising,

a racket body comprising a racket handle and a racket head frame,

a central stratum in said frame of paired, tensioned cross strings,

a first stratum of regularly spaced main strings in said frame adjacent one side of said cross string stratum, and a second stratum of regularly spaced main strings in said frame adjacent the other side of said cross string stratum, the spacing of said main strings being not more than about half of the spacing of said cross strings,

a plurality of sheaths positioned on strings of said main string strata at points of contact between said main strata strings and said cross stratum strings in at least the central zone of said racket head frame, said sheaths having a diameter of at least about one and one half times the diameter of the cross strings and a length at least about three fourths of the center-to-center spacing of the main strings, and

a set of holding strings for each of said main string strata for unifying the respective lateral movement of said main

string strata, and means positioned on said main strings for preventing the displacement of said holding strings on said main strings.

11. A method for manufacturing a tennis racket which is particularly adapted for angular momentum transfer, comprising the steps of

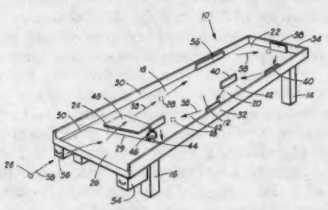
providing a tennis racket frame, stringing a strata of paired cross strings having a predetermined pair-wise separation, stringing a stratum of main strings at each side of said central cross stratum to provide two independent main string strata having main strings which are regularly spaced apart with a separation distance not more than half the pair-wise separation of said cross string pairs while concommitantly applying cylindrical sheaths having a diameter of at least one and one half times the cross string diameter and a length at least three fourths of the main string separation distance for intended points of contact between said main and cross strings, applying holding strings to each of said main string strata for connecting strings of said respective strata together for lateral movement as a unit, such that displacement of said holding strings along said main strings is restrained.

4,190,250

GAME APPARATUS

Norman J. Grifhorst, 131 N. Hillside, Wichita, Kans. 67214

Filed May 15, 1978, Ser. No. 906,100
Int. Cl.[2] A63B 71/04; A63F 9/00
U.S. Cl. 273—342 5 Claims



2. A game apparatus for receiving a rubber rolling ball thereon, the apparatus comprising:

a game table mounted on legs and having a first side portion, a second side portion, a front portion and a rear portion, said table sloped downwardly from the front portion to the rear portion of said table;

a flat launch board mounted on top of the rear portion of said table for bouncing the ball onto said table, said launch board having an angled front wall for receiving the rolling ball when the ball rolls downwardly from the top portion to the rear portion of said table;

a portion of carpet, the carpet being disposed in front of said launch board and attached to said table, said carpet acting to reduce the velocity of the ball when the ball is bounced off said launch board and onto said table;

a first sideboard extending along the length of the first side portion of said table and attached thereto;

a second sideboard extending along the length of the second side portion of said table and attached thereto;

a front board extending along the length of the front portion of said table and attached thereto;

a first sideboard bumper attached to said table and adjacent to and parallel said first sideboard;

a front board bumper attached to said table and adjacent to and parallel said front board;

a plurality of second sideboard bumpers attached to said table and adjacent to and parallel said second sideboard, said second sideboard bumpers disposed in a staggered spaced relationship to each other and extending along the length of the second side portion of said table, said second sideboard bumpers forming a scoring lane therebetween;

a score hole in the second side portion of said table and adjacent said launch board; and

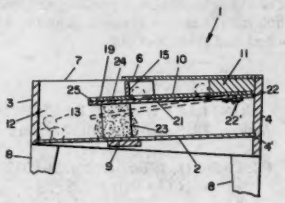
a return hole in the first side portion of said table and adjacent said launch board.

4,190,251

BUMP BOARD MARBLE GAME

Raymond M. Hall, 2339 E. 5th St., Dayton, Ohio 45403

Filed Mar. 27, 1978, Ser. No. 890,452
Int. Cl.[2] A63F 7/00, 7/10
U.S. Cl. 273—124 R 9 Claims



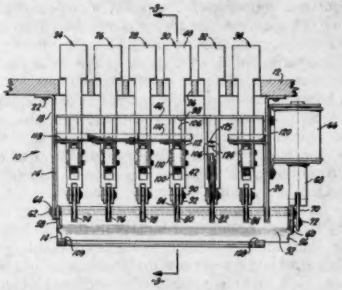
1. A bump board game for finger propelled marbles including a walled enclosure having a bottom, a flat forwardly sloping playing surface, spaced marble receiving scoring holes in said surface, dump board panel means arranged parallel beneath and engaging with said surface for retaining marbles lodged in said holes, means for pivotally connecting the rear of said panel means to the rear of said surface, and resilient compressible spring-like pad means arranged on the bottom of said enclosure beneath and to the rear of and for supporting the front of said panel means whereby manual downward pressure on the front upper surface of said panel means pivotally depresses said panel means relative to said playing surface to uncover said holes and release the marbles therein for rolling return over said panel means to the front of said enclosure.

4,190,252

MULTIPLE DROP TARGET ASSEMBLY FOR AMUSEMENT GAME

Cleon V. Kindig, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 18, 1978, Ser. No. 870,277
Int. Cl.[2] A63F 7/00
U.S. Cl. 273—127 R 12 Claims



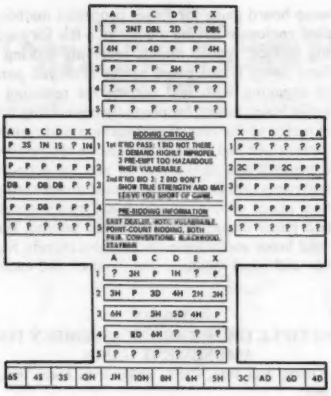
1. A mechanism for resetting a plurality of ball actuated drop targets positioned for movement relative to the ball rolling playing surface of a pin-ball game apparatus, each of said targets extending through a slot in said playing surface for

substantially vertical reciprocation therein and positioned for actuation by a ball rolling on said playing surface, said playing surface further including an exposed lower surface, said mechanism further including the combination of a frame having means for mounting the same on said lower surface, an elongated reset bar, means coupled with said reset bar for mounting the same on the frame in spaced relationship to and below said lower surface for pivotal movement about an axis extending transversely of the direction of movement of the targets, said reset bar having a cross-sectional shape providing substantial torsional rigidity, means for applying a force to one end of the reset bar to produce a movement about its longitudinal axis for pivoting said reset bar in one direction to a target reset position, means coupling said reset bar to the targets for raising the targets to said reset position as a function of the pivotal movement of the reset bar in said one direction, and latch means for releasably holding the targets in raised positions after the reset bar has reached said reset position.

4,190,253
CONTRACT BRIDGE DEVICE

Herbert H. Andrae, 88 Setauket Trail, Medford Lakes, N.J. 08055

Filed May 11, 1978, Ser. No. 904,972
Int. Cl.[2] G09B *19/22*
U.S. Cl. 273—148 **3 Claims**

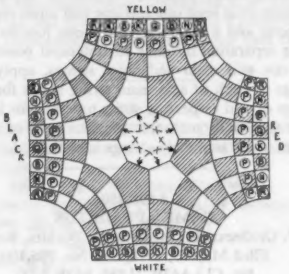

A B C D E X
1 ? 3NT DBL 2D ? DBL
2 4H P 4D P P 4H
3 P P P 5H ? P
4 ? ? ? ? ? ?
5 ? ? ? ? ? ?
BIDDING CRITIQUE
1st R'ND PASS: 1 BID NOT THERE.
2 DEMAND HIGHLY IMPROPER.
3 PRE-EMPT TOO HAZARDOUS WHEN VULNERABLE.
2nd R'ND BID 3: 2 BID DON'T SHOW TRUE STRENGTH AND MAY LEAVE YOU SHORT OF GAME.
PRE-BIDDING INFORMATION
EAST DEALER. NOTE: VULNERABLE. POINT-COUNT BIDDING. BOTH PAIR. CONVENTIONAL BLACKWOOD. STAYMAN
A B C D E X
1 ? 3H P 1H ? P
2 3H P 3D 4H 2H 3H
3 6H P 5H 5D 6H P
4 P 8D 6H ? ? ?
5 ? ? ? ? ? ?
6S 4S 3S QH JH 10H 8H 6H 5H 3C AD 6D 4D

1. A device that permits a solitary user to bid a multiplicity of simulated hands of contract bridge in the same technical manner as he would be able to do as a member of a conventional foursome and which is composed of three major components; one being an orienting tray of dimensions determined by the other components; another being a template having groupings of apertures, fitted with slides or covers designed and arranged to make possible the timely exposure and/or conceal ment of lines and columns, and a center box of data; imprinted upon a sheet of paper, one for each hand to be bid, each of which constitutes a third component of the device which in detail is; a printed geometric figure in the form of an even armed cross of practical with and heighth with each of the four arms divided into a suitable number of intersecting lines and columns forming square spaces that can be and are cross indexed by letter and numerical indices so that each square in each arm bears the same indices as the corresponding squares in all other arms and this permits the presentation of a plurality of rounds, each of four possible contract bridge bids in the form of playing card indicia and numerals to be printed in said squares using the top line of the arms for the first four bids and progressing downward through the arms of the cross for succeeding sequences of bids until the required number of bidding sequences for the hand being bid according to the rules of contract bridge has been executed and a contract established; and at the bottom leg of the cross is the hand being bid in a line of playing card indicia while in the center of the cross in the box formed by the interior dimensions of the cross there is printed the minimum information that must be known before proper bidding can be initiated.

4,190,254
"DOUBLE-CHESS" GAME BOARD

Winthrop M. Leeds, 212 Overdale Rd., Pittsburgh, Pa. 15221

Filed Jul. 29, 1976, Ser. No. 709,919
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—261 **1 Claim**



1. A chess game board having an 8-sided peripheral configuration consisting of four straight sides alternated with four concave curved sides, the playing area on said game board comprising 128 playing spaces arranged in 16 curved lanes of 8 spaces each, a group of four lanes following approximately the contour of each of said four curved sides of said game board in advancing from one straight side of said game board to the adjacent straight side, and said game board having an octagonal play-directing area at the center of said board, said area changing the 8 central playing spaces into pentagonal shapes, with said octagonal play-directing area containing 8 dotted lines bridging alternate sides of said octagonal play-directing area so as to indicate optional routes taking either a 90 degree turn to the right or a 90 degree turn to the left for those chess pieces permitted to move along a diagonal route that could take them directly toward the center of said game board.

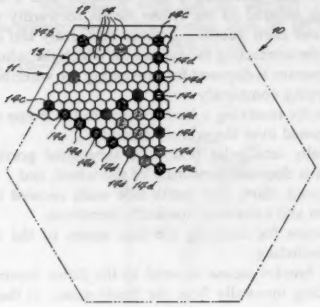
4,190,255
WORD GAME APPARATUS

Charles F. M. Hughes, P. O. Box 142, Bakerstown, Pa. 15007

Continuation of Ser. No. 708,588, Jul. 26, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,679
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—272 **5 Claims**

1. A word game apparatus, comprising a game board and a plurality of playing pieces for placement on said game board, said game board having a hexagonal playing field imprinted on the upper surface thereof in the form of a regular honeycomb pattern of smaller hexagonal spaces providing three different intersecting directions of play from left to right, the smaller hexagonal spaces at each corner carrying an indicia thereon representing a score multiplier, three connecting lines of hexagonal spaces extending from substantially the midpoint of each side of the hexagonal playing field to a like point on the opposite side dividing the playing field into six substantially equal generally pie-shaped areas each embracing 60° of the playing field between the midpoints of adjacent sides and including the corners of said hexagonal playing field, said lines intersecting at the center of the playing field, each of the hexagonal areas of each said line carrying an indicia indicating a score multiplier, a plurality of spaced score multiplier hexago-

nal areas arranged in each generally pie-shaped area, each having a fixed multiplier value, and word forming characters on each of said playing pieces, said playing pieces being hexagonal in shape and adapted to fit on any hexagonal space on the playing field, whereby words may be formed in three directions and letters of a word in one direction may serve as letters of a word in the other two directions.



4,190,256

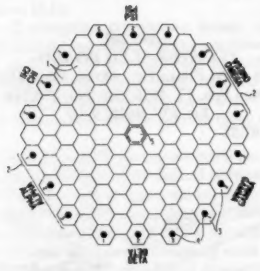
PATH FORMING GAME

Thomas J. Rudden, Jr., 6201 Hardy Dr., McLean, Va. 22101

Filed Mar. 31, 1978, Ser. No. 892,130

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—275 **10 Claims**



1. A game apparatus for two or more players comprising a game board, a variety of different types of offensive playing pieces and defensive playing pieces all in the shape of equilateral hexagons in which:

A. said game board is provided with a matrix of contiguous hexagonally-shaped spaces of about the same size and shape as said offensive and said defensive playing pieces;

B. said offensive pieces are provided for each player in a set including a variety of different types of pieces for each player, each offensive piece being characterized by the presence of at least one path therethrough defined by a distinctively identified interior segment and two or more distinctively identified peripheral segments which adjoin the edge of the piece and the interior segment; and

C. said defensive pieces are of about the same exterior dimensions as said offensive pieces but are further characterized by the absence of any path-defining, distinctively identified interior segments, although said defensive pieces may include one or more distinctively identified peripheral segments which adjoin the edges of the piece and said interior segment.

4,190,257

PACKING RING CONTAINING FLEXIBLE GRAPHITE

Danny L. Schnitzler, Port Clinton, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 1, 1978, Ser. No. 874,368

Int. Cl.[2] F16J *15/20, 15/30*

U.S. Cl. 277—102 **15 Claims**

1. A packing ring comprised of small randomly oriented particles of flexible graphite compressed together, said packing ring having a density of from 70 lbs./ft.^{3} to 120 lbs./ft.^{3}, and said particles being capable of undergoing flow with respect to each other when pressure is applied to the ring so as to cause said ring to reform its shape to the dimensions of a stuffing box.

4,190,258

FLUOROCARBON RESIN SEAL AND METHOD OF MAKING SAME

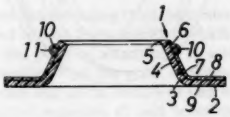
Yoshio Arai, 1400, Kamihongo, Matsudo-shi, Chiba-ken, Japan, and Kikuei Mukasa, Urawa, Japan, assignors to Yoshio Arai, Matsudo, Japan

Filed Jan. 4, 1978, Ser. No. 866,944

Claims priority, application Japan, Mar. 3, 1977, 52-23134

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—164 **4 Claims**



1. In a radial seal for sealing between two relatively movable members, including an integral sealing element formed of fluorocarbon resin and having a radially extending annular flange portion and a lip portion extending from said flange portion at an angle thereto through the intermediary of a flex section defined between said flange and lip portions, the improvement in which said sealing element is divided into a pair of first and second sections by a radial slit extending from the peripheral edge of said flange portion to a vicinity of the peripheral edge of said lip portion in parallel to the opposite surfaces of said sealing element, one of said first and second sections being bulged to form an annular pocket of substantially semi-circular cross section at a location adjacent to the peripheral edge of said lip portion; and an annular elastic member is received in said annular pocket; and the flange ends of said first and second sections are completely enclosed and fixedly secured by case means to one of said two relatively movable members so as to seal said elastic member received in said pocket from fluid flowing through said two relatively movable members.

4,190,259

SINGLE APEX TWO ELEMENT FLUID PRESSURE SEAL ASSEMBLY

Gordon T. Zitting, Sandy, Utah, assignor to Microdot Mfg., Inc., Salt Lake City, Utah

Filed Sep. 8, 1978, Ser. No. 940,534

Int. Cl.[2] F16J *9/00, 15/24*

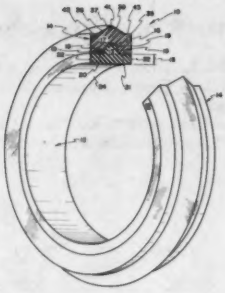
U.S. Cl. 277—165 **7 Claims**

1. A two element compression seal assembly comprising:

an endless relatively soft annular spring element of yieldable material with memory and having a solid generally rectangular cross-sectional configuration with an annular projection extending toward the other element, an annular shoulder being disposed on each side of the projection;

an endless annular sealing element comprising a body of relatively hard wear resistant synthetic resinous material having a generally U-shaped cross-sectional configuration with the base comprising the U thereof contiguously receiving said annular projection;

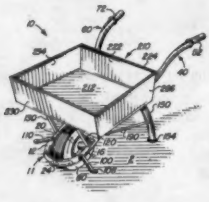
said sealing element further comprising spaced radially directed anti-extrusion legs, the length of said legs being substantially the same as the distance the annular projection extends into the U of the sealing element in mating fully contiguous relation, the sealing element further comprising annular shoulders on each side of the U each shoulder being fully contiguously engaged by the adjacent spring element shoulder, the interface between the two elements being fully contiguous and comprising a force resistant flex site across which fluid is prevented from flowing, the spring element extending a short distance radially beyond the legs to compressively engage and



accommodate creation of a static seal against substantially the entire surface area of the base of a groove in a first machine part;

said sealing element further comprising a delta-shaped projection having a central apex extending radially away from said anti-extrusion legs and adapted to extend beyond said machine groove and compressively engage the surface of a second machine part causing said apex to be slightly flattened and to create a dynamic annular line seal along the entirety of the 360 degrees of said slightly flattened apex, the width of the line seal being substantially less than the width of either of the two elements.

4,190,260
WHEELBARROW APPARATUS
Junior B. Pearce, 670 S. 14th Ave., Yuma, Ariz. 85364
Filed Aug. 24, 1978, Ser. No. 936,530
Int. Cl.[2] B62B *1/18*
U.S. Cl. 280—47.31 **8 Claims**



1. Wheelbarrow apparatus, comprising, in combination:

frame means, including

a generally u-shaped frame member,

a first and a second side arm connected to the u-shaped frame member and extending rearwardly from the u-shaped member;

handle means connected to the side arms for lifting and maneuvering the apparatus, including

a first handle secured to the first side arm, and

a second handle secured to the second side arm, both first and second handles extending rearwardly and upwardly from the frame means;

a wheel secured to the frame means;

stabilizer means including a first stabilizer and a second stabilizer secured to the frame means forwardly of the wheel, and each stabilizer extends outwardly and downwardly for contacting the surface on which the wheelbarrow apparatus is disposed for preventing the wheelbarrow from tipping completely over;

box means for receiving a load secured to the frame means and disposed over the wheel, including

a generally retangular bottom, a substantial portion of which is disposed forwardly of the wheel, and

first, second, third, and fourth side walls secured to the bottom and extending upwardly therefrom;

bracket means for securing the box means to the frame means, including

forward bracket means secured to the frame means and extending upwardly from the frame means to the box, and

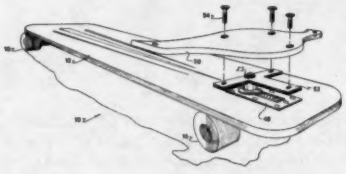
rear bracket means secured to the frame means and extending upwardly to the box; and

leg means secured to the frame means adjacent the rear bracket means for supporting the wheelbarrow apparatus at the rear thereof when the wheelbarrow apparatus is in a static position, including

a first leg disposed adjacent the first side arm and the first handle and extending downwardly,

a second leg disposed adjacent the second side arm and the second handle and extending downwardly and spaced apart from the first leg.

4,190,261
COASTER-SLED BOARD
John A. Moutz, 2884 Eileen Dr., Akron, Ohio 44319
Filed Feb. 17, 1978, Ser. No. 878,715
Int. Cl.[2] B62K *9/00*
U.S. Cl. 280—87.01 **5 Claims**



1. A land vehicle comprising:

a flat support frame having a longitudinally extending slot therein,

support means for said frame and including a front member, pivotally positioned brake means for the vehicle, and a steering and brake control assembly operatively engaging said front member, said steering and brake control assembly having a steering apparatus and a braking apparatus, said braking apparatus having a finger guide, and

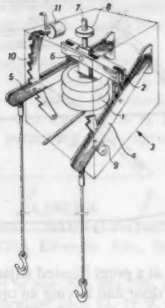
flexible connecting means operably extending between said pivotally positioned brake means and said braking apparatus to actuate said pivotally positioned brake means upon forward movement of said steering and brake control assembly;

said steering apparatus rotatable within said braking apparatus, said finger guide of said braking apparatus slidable within said slot.

4,190,262
DEVICE FOR SECURING A LOAD ON A VEHICLE

Kurt E. Johansson, Timmermansgatan 12, S-981 00 Kiruna, Sweden

Filed May 3, 1978, Ser. No. 902,425
Claims priority, application Sweden, May 10, 1977, 7705404
Int. Cl.[2] B60R 11/00
U.S. Cl. 410—37 9 Claims



1. A device for securing a load on a load-carrying vehicle comprising:

a frame (3) attached to said load-carrying vehicle;

expansion means (1) mounted to said frame (3), said expansion means (1) having at least one expansion member which is movable relative to said frame (3);

a plurality of tensioning arms (4, 5), said tensioning arms each having first and second ends, each of said plurality of tensioning arms being hingedly mounted to said frame (3) substantially near said first ends of said plurality of tensioning arms (4,5);

a plurality of elongated connecting means, each of said elongated connecting means having a terminal end and a free end, each of said terminal ends of said plurality of elongated connecting means being attached to a respective one of said plurality of tensioning arms (4, 5) substantially near said second ends of said plurality of tensioning arms;

at least one balance arm (2) having a central portion and first and second end portions, said central portion being pivotally connected to said at least one expansion member of said expansion means (1), said first and second end portions of said balance arm each being coupled to a respective one of said plurality of tensioning arms (4,5);

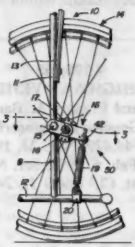
whereby after passing said plurality of elongated connecting means over a load on said load-carrying vehicle and securing said free ends of said elongated connecting means to said load carrying vehicle, said expansion means (1) is expanded, thereby displacing said at least one balance arm (2) and said plurality of tensioning arms (4, 5) relative to said frame (3) to draw said plurality of elongated connecting means taut and to secure said load to said load-carrying vehicle.

4,190,263
WHEELCHAIR WITH SHOCK ABSORBER

Samuel T. Powers, Albuquerque, N. Mex., assignor to Albuquerque Patents, Ltd., Albuquerque, N. Mex.

Filed May 22, 1978, Ser. No. 908,245
Int. Cl.[2] B62M 1/14
U.S. Cl. 280—242 WC 7 Claims

1. In combination, a wheelchair and shock absorber, comprising: a rigid frame having a vertical frame member with an axle mounted thereon, a horizontal frame member attached to the lower portion of said vertical frame member; and wherein said shock absorber includes a lever member with one end of said lever member pivotally mounted on said axle, and wherein said wheel is rotatably mounted on said lever member at a point which is longitudinally spaced from the end of said lever member which is mounted on said axle, and a shock absorbing means which has one end attached to said lever member at a point which is longitudinally spaced from the end of said lever member which is mounted on said axle, the other end of said shock absorbing means being attached to one of said frame members; and further wherein said lever member comprises a first segment which extends for the entire length of said lever member, a second segment laterally spaced from and parallel

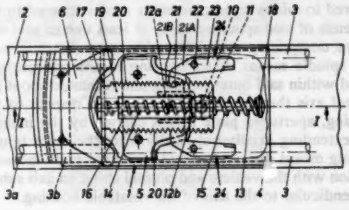


to said first segment and extending from the center of said lever member to the end of said lever member which is longitudinally opposed to the point of attachment to said axle, and a third segment extending from the point of connection of said lever member to said axle to the middle of said lever member, said first and second segments of said lever member being connected by laterally extending connecting segment, said second and third segments being connected by a hollow tubular segment; and further wherein said lever member is attached to said axle by a bolt which passes laterally through said first segment and said thid segment.

4,190,264
SAFETY SKI BINDING

Alois Himmetsberger, and Heinz Wittmann, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Apr. 13, 1978, Ser. No. 896,234
Claims priority, application Austria, Apr. 15, 1977, 2635/77
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—618 10 Claims



1. A safety ski binding comprising a pivotally supported sole plate provided adjacent a front end thereof with a jaw plate having a holding jaw pivotally supported for movement about an axis which is perpendicular with respect to an upper surface of a ski, said sole plate being maintained in a centered position at said front end by means of a locking mechanism which is released upon exceeding a predetermined torque, the improvement comprising wherein said locking mechanism has a mounting plate secured to said ski, said mounting plate having control surface means thereon which extends symmetrically with the central longitudinal axis of said ski over a two-part acute angle ($\alpha+\beta$), said mounting plate and said control surface means lying in a plane which is substantially parallel to said upper surface of said ski, a control piece mounted on said jaw

plate and engaging said control surface means, wherein one part of said acute angle (α) is predetermined by an angle the longitudinal axis of said sole plate makes with said longitudinal axis of said ski to effect a release and the size of the other part of said acute angle (β) is determined by the relationship tangent $\beta \cong \mu$, wherein μ is the coefficient of friction between said control surface means on said mounting plate and said control piece, and wherein said control surface extending over the other part of said acute angle (β) is oriented at the angle ($\alpha+\beta$) to the longitudinal axis, and resilient means for biassing said control piece, following a release, rearwardly when in contact with said control surface means within said other part of said acute angle (β).

4,190,265

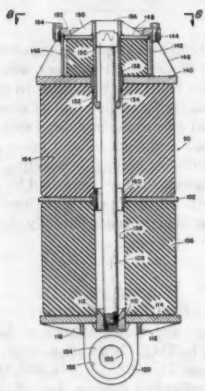
OFF-HIGHWAY VEHICLE

Edgar R. Goodbary, and Francis A. Bartley, both of Cardin, Okla., assignors to Goodbary Engineering Co., Cardin, Okla.

Division of Ser. No. 744,429, Nov. 23, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,193

Int. Cl.[2] B60G *11/24*

U.S. Cl. 280—716 **4 Claims**



4. In an off-highway vehicle, universal mounting means operably connected between the vehicle and vehicle wheels and comprising a substantially upright spindle means operably secured to said wheels, connector means secured to the opposite ends of said spindle means, at least one of said connector means comprising a non-rotatable outer housing secured to said spindle means, inner housing means concentrically disposed within said outer housing and rotatable about the longitudinal axis thereof independently with respect to the outer housing, apertured plate means carried by the inner housing and extending axially outwardly from the outer housing, and bearing means disposed in said apertured plate means for connection with the vehicle and pivotal about an axis substantially perpendicular to the axis of the rotatable housing.

4,190,266

PASSIVE SEAT BELT SYSTEM

Joseph M. Cachia, Knoxville, Tenn., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

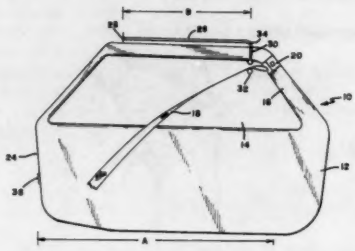
Filed Sep. 28, 1977, Ser. No. 839,158

Int. Cl.[2] B60R *21/02*

U.S. Cl. 280—802 **7 Claims**

1. In a vehicle passive seat belt restraint system including a seat belt having one end attached at a point of attachment to a door of said vehicle and the opposite end attached in the interior of said vehicle such that when the said door is closed, said belt is automatically moved to a first position at which it restrains an occupant when seated in his seat and when said door is opened, said belt is moved to a second position located forward of said vehicle with respect to said first position, to permit free ingress to and egress from said vehicle, said door having a pivot point upon which said door pivots during opening and closing, the improvement for moving said belt to said second position upon only partial opening of said door, said improvement comprising:

rod means having one end pivotally connected to the frame



of the vehicle at a point located adjacent to and above the height of said door and having an opposite end communicating with said seat belt, the distance between said one end and said opposite end of said rod means being less than the distance between said pivot point of said door and said point of attachment of said seat belt to said door, whereby partial opening of said door causes said rod means to move said belt to its second position.

4,190,267

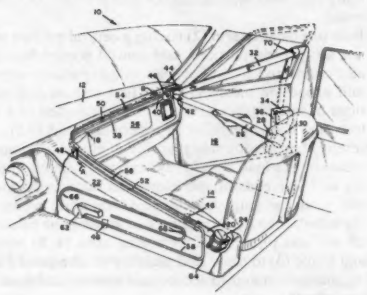
PASSIVE SEAT BELT SYSTEM

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 12, 1978, Ser. No. 923,854

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—803 **10 Claims**



1. A passive seat belt restraint system comprising:

a seat belt adapted for restraining an occupant positioned in a seat in said vehicle;

said seat belt having a first end connected to a door of said vehicle adjacent to said seat and a second end connected to said vehicle at the side of said seat opposite said door;

at least one of said first and second ends being connected to said vehicle through a seat belt retractor;

track means comprising a first portion mounted in said vehicle at a location adjacent to said side of said seat, said first portion extending from a point adjacent to the rear of said seat to the dashboard of said vehicle located in front of said seat, and a second portion provided in said dashboard and extending from said first portion towards said door,

said first and second portions being in communication with each other;

seat belt support means movable in at least said first portion of said track means, said means supporting said seat belt at a first location at least when said seat belt is in a non-restraining position;

connecting means connecting said seat belt to said track means and located in said track means at a second location which is closer to said door than said first location when said seat belt is in a non-restraining position, said connecting means being movable along said first and second portions of said track means; and

means for moving said seat belt support means and said connecting means from a first position at which said seat belt is in position to restrain the occupant, to a second position at which said seat belt is in a non-restraining position, thereby permitting easy ingress to and egress from the seat.

4,190,268

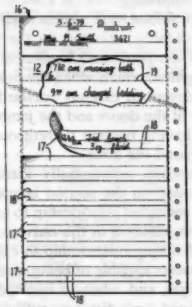
MEANS FOR RECORDING PATIENT CARE

David F. Webster, 1325A Edwards Ave., Santa Rosa, Calif. 95401

Continuation-in-part of Ser. No. 961,759, Nov. 17, 1978, abandoned. This application May 11, 1979, Ser. No. 38,340

Int. Cl.² B42D *12/02*

U.S. Cl. 282—3 R **2 Claims**



1. Means for recording the care given a patient comprising:

(a) a base sheet having opposite marginal edges extending longitudinally of the base sheet;

(b) a strip of carbon paper extending over the base sheet between the opposite marginal edges;

(c) an opaque cover sheet overlying the carbon strip and the base sheet and having opposite marginal edges extending longitudinally of said top sheet in a matching relationship to the marginal edges of the base sheet and being readily separable from the base sheet;

(d) and a top sheet composed of a plurality of separable strips each extending between the longitudinal marginal edges of the cover sheet and each being lightly secured adhesively to the cover sheet for removal from the cover sheet one at a time.

4,190,269

ADAPTER FOR EXHAUST ACTUATED DEVICES

John W. Purdy, Vancouver, Canada, assignor to Wesgar Industries Ltd., Vancouver, Canada

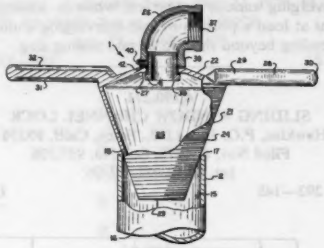
Filed Mar. 29, 1978, Ser. No. 891,448

Int. Cl.² F16L *35/00*

U.S. Cl. 285—38 **12 Claims**

1. An adapter for detachably interconnecting an exhaust stack with an exhaust actuated device, said adapter comprising:

(a) a hollow, frustroconically shaped body having first and second ends, and an inclined side wall extending therebetween; said first end being open for receiving exhaust gases from the stack therethrough, and said second end communicating with said first end and having means for operably connecting said exhaust actuated device therewith; said body side wall including spiral threads on an exterior surface thereof which are adapted for engaging



an interior, free edge of said stack, and rotatively locking said adapter therein; and wherein

(b) said adapter side wall is constructed of a material having a coefficient of thermal expansion which is greater than that of said stack, whereby during operation, said adapter expands with respect to and within said stack to form a secure and substantially airtight seal therebetween.

4,190,270

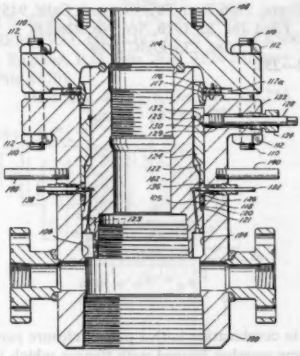
TUBING HANGER FOR TEMPERATURE VARIATIONS AND EXTREMES

Delbert E. Vanderford, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Dec. 30, 1977, Ser. No. 865,837

Int. Cl.² F16L *21/00*

U.S. Cl. 285—142 **9 Claims**



1. A hanger comprising

a body having a central bore with an upwardly facing seat therein,

a tubular hanger positioned within said central bore on said seat,

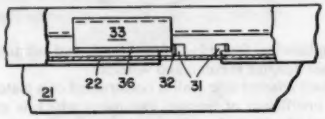
an annular converging space free of obstructions and located between the interior of said body and the exterior of said hanger,

a metal seal ring in said converging annular space and freely movable therein in the direction of convergence until said seal ring engages the interior of said body and the exterior of said hanger,

a sleeve around a portion of the exterior of said hanger, engaging said seal ring and slidable axially on said hanger, and

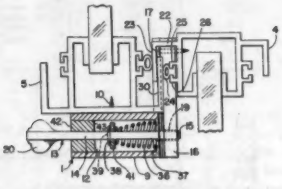
means extending through the wall of said body engaging and exerting a force on said sleeve whereby said sleeve is driven in the direction of convergence of said space until said seal ring is forced into sealing engagement between said hanger and said body, said sealing ring moving axially to sealing engagement with its inner and outer surfaces being maintained substantially parallel to the sides of said converging annular space and when in sealing engagement at least a portion of said converging annular space extending beyond the end of said sealing ring.

4,190,271
SLIDING WINDOW CHANNEL LOCK
Donald Hawkins, P.O. Box 1203, Tracy, Calif. 95376
Filed Nov. 6, 1978, Ser. No. 957,738
Int. Cl.[2] E05C *19/06*
U.S. Cl. 292—145 **10 Claims**



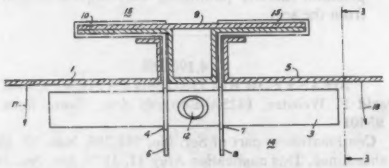
1. In a channel-like track construction for receiving a sliding member and including a plurality of protrusions extending into the track channel, a locking device shaped to permit movement past said protrusions and abut a selected protrusion and for preventing translation of said sliding member, including means for releasably engaging any one of said protrusions in immobilizing fashion, and means for permanently securing said locking device in said track channel.

4,190,272
SCREW LOCK FOR INTERLOCKING SLIDING DOOR AND WINDOWS
Eugene R. Beard, 3186 Reva Dr., Concord, Calif. 94519
Filed Jul. 20, 1978, Ser. No. 926,538
Int. Cl.[2] E05C *5/04*
U.S. Cl. 292—251 **3 Claims**



1. A lock in combination with a pair of closure panels each having a frame member formed with flanges which interlock upon closure and at least one of said panels is slidably mounted in a track; said lock comprising:
   a. a lock housing affixed to said flange of one of said interlocking frame members and formed with a chamber having first and second axially spaced end walls;
   b. a lock bolt mounted in said housing for rotatable and axial reciprocating movement having a threaded portion at one end and a manually engageable member at the other end;
   c. a spring retainer connected to a mid portion of said lock bolt;
   d. a spring mounted within said chamber between said first wall of said chamber and said spring retainer and mounted to bias said spring retainer toward said second wall;
   e. a keeper mounted in a notch formed in said flange of the other of said interlocking frame members and formed with a threaded opening for threaded registration with said movable bolt; and
   f. said flange holding said lock housing is formed with a notch for registration with said keeper when said panels are in the closed position to prevent relative vertical movement of said panels.

4,190,273
CABINET LOCK ASSEMBLY
Carl E. Schaffrin, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 6, 1978, Ser. No. 913,188
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—288 **1 Claim**

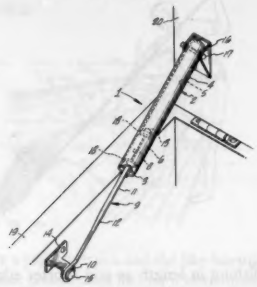


1. An apparatus for locking a pair of doors which open outward and abut when closed onto two lateral extensions of a common jamb, comprising:
   a. a first bracket, folded back against itself at its interior edge so as to be slidably mounted on the first of the lateral extensions of the jamb, said bracket including a laterally extending segment which when the bracket is mounted in the manner described extends outwardly from the space between one of the doors and the jamb beyond the door, said bracket having passage therethrough in the segment extending beyond the door;
   b. a second bracket, substantially identical to said first bracket, mounted on the second lateral extension of the door jamb in mirrored relationship to said first bracket so as to align the passages in the outwardly extending segments in confronting relationship to each other;
   c. a rod-like member capable of being inserted through both bracket passages, and when so inserted extends laterally either side of said jamb distances sufficient to obstruct the opening of both doors;
   d. a passage through said rod-like member, substantially transverse to its longitudinal axis, said transverse passage being medial of the brackets when said member is inserted therethrough; and
   e. a retention means for limiting the lateral travel of the rod to prevent removal thereof, said means capable of being inserted through the transverse passage in said rod-like member when the passage is medial of said brackets.

4,190,274
FRICTION SUPPORT DEVICE
David Gross, Laguna Niguel, Calif. 92677, and Hugh V. Jorgensen, San Marino, Calif. 91108
Filed Jan. 23, 1978, Ser. No. 871,607
Int. Cl.[2] E05C *17/44*
U.S. Cl. 292—338 **12 Claims**

1. A friction support device for supporting two members in variable positions relative to one another comprising:
   a tube assembly to provide an outer protective covering having an aperture extending lengthwise through its central portion;
   a slide holder of a resilient polymeric material having an aperture extending lengthwise through its central portion, the slide holder being inserted into one end of the tube assembly;
   a slide rod having a tapered shaft which is inserted through

the aperture in the slide holder and extends into the tube assembly, and which frictionally engages the slide holder; means for fastening the tube assembly to the first member;



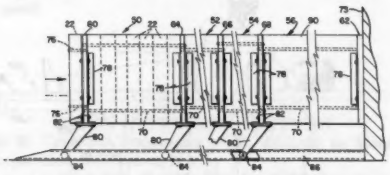
means for fastening the proximal end of the slide rod to the second member.

4,190,275

IMPACT ATTENUATOR

Robert A. Mileti, Marblehead, Mass., assignor to Fibco Inc., Tewksbury, Mass.

Filed Mar. 16, 1978, Ser. No. 887,127
Int. Cl.[2] B60R *19/04, 19/08*
U.S. Cl. 293—102 **1 Claim**



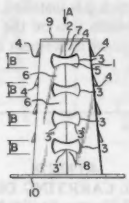
1. An impact attentuator for decelerating a vehicle as it approaches a fixed hazard adjacent to a roadway comprising a plurality of expanded plastic sheets, each sheet having opposed essentially flat faces extending essentially normal to the path of the vehicle, a plurality of cells extending between said faces, the longitudinally axes of said cells being essentially parallel and normal to the planes of said faces, said sheets being from 2.5 inches to 4 inches thick and formed by drawing a solid plastic sheet having an initial thickness of from 0.125 inches to 2.50 inches, said sheets being adapted to be compressed upon impact to substantially less than half their normal thickness without structural damage and thereafter resume their normal thickness, means securing a plurality of said sheets together in face to face contact to form a columnar structure, stiffening panels interposed between certain of said sheets at intervals along the length of said structure, and means for supporting said columnar structure to dispose the central portion thereof above ground level substantially at the height of the center of gravity of the vehicle in position to intercept said vehicle as it approaches said hazard, said last-mentioned means comprising a pair of rails extending away from said hazard at ground level, and rail engaging means carried by said stiffening panels and effective to prevent lateral and vertical displacement of said columnar structure upon impact by a vehicle, said columnar structure being effective to exert a resisting force upon impact which increases as a direct function of the distance to which said impacting vehicle penetrates said structure.

4,190,276

DEFORMABLE IMPACT ABSORBING DEVICE FOR VEHICLES

Tomoyuki Hirano, Tokyo; Akira Yamanaka, and Koichi Tonai, both of Yokohama, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1977, Ser. No. 860,626
Claims priority, application Japan, Dec. 22, 1976, 51-155333; Feb. 3, 1977, 52-11265; Jun. 8, 1977, 52-68270
Int. Cl.[2] B60R *19/06*
U.S. Cl. 293—133 **15 Claims**



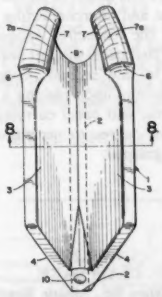
1. An impact absorbing device comprising a hollow polyhedral body having planar side walls and a longitudinal axis, a plurality of elongated cutouts formed in each of the side walls of said polyhedral body and extending in parallel relation in a direction substantially orthogonal with respect to the longitudinal axis of said polyhedral body, said cutouts each having a pair of opposed longer edges extending substantially orthogonal of said longitudinal axis, and means for guiding continuous deformation of said polyhedral body on its longitudinal axis including each said cutout having one of its longer edges protruding outwardly relative to the other longitudinal edge of the same cutout whereby the energy of impact imparted in an axial direction of said polyhedral body can be absorbed by the deformation of the side walls of said polyhedral body.

4,190,277

DEVICE FOR INSERTION, MANIPULATION AND REMOVAL OF SOFT CONTACT LENSES

Robert C. England, P.O. Box 2829, 1024 Military Rd., Zanesville, Ohio 43701

Filed Aug. 30, 1978, Ser. No. 938,216
Int. Cl.[2] A61F *9/00*
U.S. Cl. 294—1 CA **10 Claims**



1. A device for inserting and removing a soft contact lens from the eye of a wearer, and comprising

a body adapted to be held in the hand and moved thereby universally relative to the eye;

a pair of lens engaging elongated pads carried by the body in spaced relation to each other transversely of their lengths;

said pads having elongated lens engaging faces, respectively;

said faces being curvilinear and concave toward each other

in longitudinal section and being curvilinear and convex toward each other in cross section, and, in the normal spaced position of the pads being engageable with the anterior face of a soft contact lens in the form of a spheroidal segment at locations thereon inwardly from the edges of the lens and spaced apart transversely of the lens, while the lens is installed on the eye, said pads being movable toward each other by portions of the hand, while said faces are so engaged with the installed lens, to cause said faces to flex the lens out of its normal spheroidal contour in a manner to admit air between the rear face of the lens and the eye on which it is installed, and to hold the lens in flexed condition while it is on the eye and during its removal from the eye by movement of the body away from the eye.

4,190,278

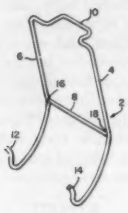
PANEL CARRYING DEVICE

Frank Jancik, Jr., 5510 Newton St. #6, Hyattsville, Md. 20784

Continuation of Ser. No. 596,819, Jul. 17, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,920

Int. Cl.[2] B65G *7/12*

U.S. Cl. 294—26 **5 Claims**



1. A panel carrying device comprising a pair of support members, each having a first panel support portion and a second portion, said second portion of each of said support members including a point of connection to said first panel support portion and an end, each of said second portions of said pair of support members being curved from its point of connection to its end about a single locus disposed on one side thereof, a first bar disposed between and interconnecting said support members at substantially the respective apogees of their second curved portions, said first panel support portions disposed at an angle with respect to said second portions and extending toward said loci, whereby upon placing a panel on said first panel support portions, said panel carrying device rocks upwardly to a sufficient degree to permit said panel carrying device to be readily grasped.

4,190,279

CLAM RAKE

Aldo Sguazzin, 115 Aspen Rd., Mastic Beach, N.Y. 11951

Filed Oct. 23, 1978, Ser. No. 953,418

Int. Cl.[2] E02F *5/00*

U.S. Cl. 294—49 **3 Claims**

1. A clam rake comprising a handle, a rectangular basket framed of heavy gauge wire affixed to said handle at one of the longer edges of said rectangular frame, a plurality of raking teeth affixed to the other longer edge of said rectangular frame, side skids being affixed to the shorter edges of said rectangular frame and a plurality of fingers affixed to said skids, the length of said fingers being the same as the raking teeth at the end of sid shorter edge in proximity to said raking teeth and said

fingers diminishing in length as said shorter edge approaches the end of the shorter edge in proximity to the handle.

4,190,280

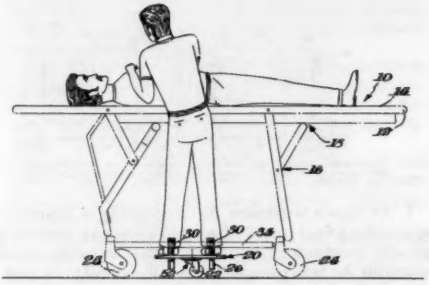
WHEELED PATIENT SUPPORT

Stephen C. Donohoe, 714 S. DuPont St., Wilmington, Del. 19805

Filed Sep. 14, 1978, Ser. No. 942,338

Int. Cl.[2] A61G *1/02*

U.S. Cl. 296—20 **9 Claims**



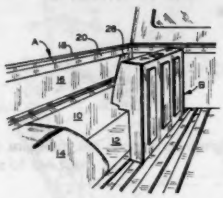
1. In a wheeled patient support having spaced rails with a patient supporting surface mounted therebetween and a wheeled structure mounted thereunder to comprise a mobile patient supporting unit whereby a patient may be placed on the supporting surface and wheeled to an area of treatment during conditions of emergency or the like, the patient supporting surface being substantially longer than it is wide, the patient supporting surface including a head supporting area and a feet supporting area with a body supporting area therebetween and the areas all being generally coplanar in a horizontal plane, the improvement being a platform secured to said unit laterally beyond the periphery of said unit and substantially below said patient supporting surface for supporting a standing attendant thereon, said platform being substantially shorter in length than the length of said patient supporting surface, said platform being located in the general area of said body supporting area, and a rolling surface mounted to and beneath said platform in the same plane as the rolling surfaces of said wheeled structure whereby the attendant may stand on the platform and treat the patient while the patient is being moved to the area of treatment.

4,190,281

BALLAST FOR PICK-UP TRUCKS AND THE LIKE

Steven G. Chandler, 1010 E. Warren, Bucyrus, Ohio 44820

Filed Oct. 30, 1978, Ser. No. 955,803
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—37.6 7 Claims



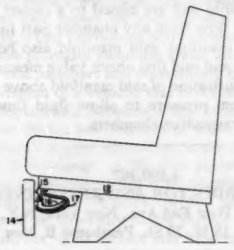
1. Ballast for a pick-up truck and the like having a cargo bed with a floor, side panels each having a horizontal top portion, spaced apart vertical members along the side panels, and a turned down angular member projecting inwardly from the top portion of said side panel, said ballast comprising: a container having inner and outer major container sides, end sides and a top and bottom for the container; said inner and outer container sides generally conforming in length to the space between the spaced apart vertical members; said inner side conforming in shape to the shape of the side panel with which it is to abut, and said ends and top having a width conforming to the width of said top portion between said panel and said inward projection of said turned down angular member, and whereby said container can be inclined outwardly to slip the top inwardly of said turned down angular member between said vertical members, and said bottom then slipped inwardly to bring the container into a vertical position locked against the side panel.

4,190,282

OTTOMAN PROTECTING DEVICE

Allan H. Crawford, Amsterdam, N.Y., assignor to Mohasco Corporation, Amsterdam, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,219
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—68 3 Claims



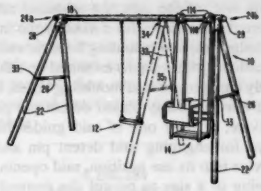
1. A guard member for protecting a fabric or other covering on a portion of the surface on an ottoman against wear, said guard member rotatably carried on an ottoman, said ottoman being carried on and cooperative with a chair, actuating means connected to said guard member, said guard member movable from a first position wherein the distal end of said guard member is positioned beneath said chair and spaced from said ottoman, to a second position wherein the distal end of said guard member is positioned in overlying relationship to a facing edge portion of said ottoman.

4,190,283

FOLDABLE PLAY GYM

Raymond W. Boucher, Dotham, Ala., assignor to Hedstrom Co., Bedford, Pa.

Continuation of Ser. No. 811,176, Jun. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 665,539, Mar. 10, 1976, abandoned. This application May 22, 1978, Ser. No. 908,332
Int. Cl.[2] A47C *15/00*
U.S. Cl. 297—77 12 Claims



12. A play gym comprising:

A. a horizontal bar,

B. a leg assembly supporting at least one end of the bar, said assembly including

1. a pair of relatively long tubular legs,
2. a pivot joint engaged over one end of the horizontal bar said pivot joint having a pair of diverging arms extending perpendicular to the axis of the horizontal bar,
3. means for connecting the pivot joint to said one end of the horizontal bar,
4. means for pivotally connecting one end of each of said legs to a different one of said arms, said pivotal connecting means being parallel to each other and also perpendicular to the axis of the horizontal bar so that said legs can be swung from a first position wherein they diverge and extend perpendicular to the horizontal bar to a second position wherein they lie substantially parallel to the axis of the horizontal bar, and
5. means for releasably maintaining the legs in their first position so that they support said end of the bar above the ground,

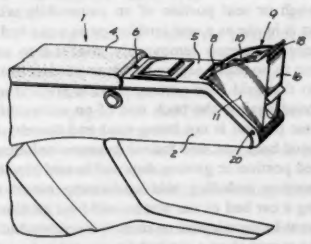
C. means for supporting the opposite ends of the bar above the ground.

4,190,284

VEHICLE SEATS

Karl Schmidhuber, NT-Rossdorf, and Hans D. Lehmann, Dettingen-Guckenrain, both of Fed. Rep. of Germany, assignors to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,506
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 7717085[U]
Int. Cl.[2] A47C *7/62*
U.S. Cl. 297—194 5 Claims



1. In a vehicle seat, especially for airplanes and omnibusses,

having at least one arm rest formed generally as a box beam support, said arm rest having opposing side walls and a front terminal section, a closure member covering at least the front terminal section of the arm rest, said closure member having an opening therethrough, a control device arranged in said front terminal section, means for rotatably mounting said control device about an axis transverse to the longitudinal axis of the arm rest from a non-use position wherein the control device lies inside the arm rest and closes the opening of said closure member, through said opening and into a use position and back, the improvement comprising a guide affixed to the inside of each side wall of the arm rest adjacent the front terminal section thereof, said means for rotatably mounting the control device including aligned mounting bores in each guide and side wall and resiliently biased pins mounted on said control device for rotatably engaging in said mounting bores, further comprising at least one resiliently biased detent pin provided on said control device, at least one of said guides having detention point means for engaging said detent pin and arresting said control device into its use position, said opening in the closure member being of a size to permit the control device to pass completely therethrough.

4,190,285

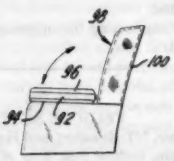
SUPPORT FRAMES ADAPTED FOR USE WITH CAR SEATS AND BEDS

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 758,846, Jan. 12, 1977, Pat. No. 4,075,720. This application Dec. 14, 1977, Ser. No. 860,621

Int. Cl.[2] A47D *1/10*

U.S. Cl. 297—254 **2 Claims**



1. A support frame for use in securing a car bed or car seat deployed on the seat of an automobile, comprising, in combination, a base portion having a top surface and a bottom surface, cushioning means disposed on each of said top and bottom surfaces of said base portion, the bottom surface of said base portion and cushioning means therefor being adapted to rest on the bench or seat portion of an automobile when said base portion is in use as a seat cushion or as a car bed or seat base, and securing means removeably attached to an automobile backrest to pivotally secure said base portion to an automobile seat, so that said base portion may be pivoted upwardly and positioned against the back rest of an automobile seat when said base portion is not being used and thereby function as a cushioned back rest, and fastening means including at least one recessed portion or groove disposed in said top surface of said base portion including said cushioning means therefor, for securing a car bed or car seat to said base portion, said fastening means being adapted to receive a corresponding fastening member mounted on a car bed or car seat to be secured to said top surface of said base portion through said cushioning means.

4,190,286

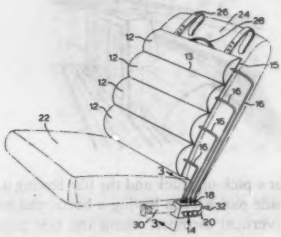
INFLATABLE SEAT CUSHION AND BODY SUPPORT ASSEMBLY

John P. Bentley, 100 Dixie Plaza, 1250 S. Service Rd., Mississauga, Ontario, Canada

Filed Dec. 20, 1977, Ser. No. 862,542

Int. Cl.[2] A47C *7/42*

U.S. Cl. 297—284 **7 Claims**



1. For use as a seat cushion and body support, an inflatable seat cushion assembly, comprising:

A plurality of independent and individually inflatable chambers, each of said plurality of chambers being secured to at least one other chamber; and

means for controlling each of the chambers, including, for each chamber;

first valve means for connecting a chamber to a pressure source of fluid for inflating a chamber, said check valve means permitting fluid flow from said pressure source of fluid, when pressurized, to the respective chamber, said first check valve means being closable for maintaining said fluid in a respective chamber at a desired amount of inflation thereof;

conduit means for said fluid between said first check valve means and a chamber;

second seatable valve means provided in a control block and in fluid communication with said conduit means and operable to release fluid from a respective chamber, said seatable valve means being biased to a closed position and including means for unseating said valve means to permit fluid flow past the valve to a lower pressure sink while the valve is unseated by said means therefor; and

wherein all of said first check valve means are also located in said control block and communicate with a common pressure manifold and are biased to a closed position to preclude fluid flow from any chamber past its respective valve to said manifold, said manifold also being in said control block, and said first check valve means are operable upon pressurization of said manifold above a predetermined minimum pressure to allow fluid flow past said valves to the respective chambers.

4,190,287

KNEE ABDUCTOR AND RESTRAINER

Ellen Lemisch, 711 West End Ave., New York, N.Y. 10025, and Fredrik Rostock, 18 W. 70 St., Penthouse B, New York, N.Y. 10000

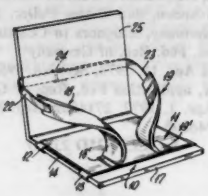
Filed Jun. 28, 1978, Ser. No. 919,814

Int. Cl.[2] A47C *31/00*; **A62B** *35/00*

U.S. Cl. 297—466 **6 Claims**

1. A knee abductor and restrainer for use on chairs having seats and backs such as wheel chairs and the like comprising a pair of flexible restraining straps, means for securing said straps to the forward portion of the chair seat and in spaced relationship one to the other, said straps extending upwardly about the inner portions of the legs of the user, diagonally across the legs and rearwardly about the body of the user and embracing the abdomen to maintain the legs of the user in a separated position

and means on the ends of the straps for attaching them to the chair back whereby said straps extend about the legs and body



of the user to maintain the user in an upright position while permitting use of the legs.

4,190,288

BACK-HOLDING DEVICE FOR AUXILIARY SEATS, PARTICULARLY CHILDREN'S SEATS, TO BE PLACED ON CONVENTIONAL VEHICLE SEATS

Heinz Korger, Niederstotzingen, Fed. Rep. of Germany, assignor to Carl Stahl GmbH & Co. KG, Herbrechtingen, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,914

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725577

Int. Cl.[2] B60R *21/10*; A62B *35/00*

U.S. Cl. 297—488 **14 Claims**

1. A safety restraining device for use with a conventional vehicle seat, such as for a child, comprising a pair of rigid side members spaced laterally apart in the direction transverse to the normal direction of movement of a vehicle, said side members extending in the normal direction of movement of a vehicle and having a front end facing in the normal forward direction of movement and an oppositely directed rear end with an upper surface and a lower surface extending between said front end and rear end, means for securing said side members to a vehicle body, a first restraining body located between said side members and pivotally mounted about an axis extending between said side members and transversely of the normal direction of movement of a vehicle, said first restraining body being pivotally displaceable between a first position where a child seated in the device has freedom of movement and a second position where forward movement in the normal direction of movement is restrained, in the first position said restraining body having a front end facing in the normal forward direction of movement of a vehicle and a rear end facing in the opposite direction with an upwardly facing surface extending between the front and rear ends thereof and forming a horizontal table surface and a downwardly facing surface spaced below said upwardly facing surface, the rear end of said first restraining body being located between the front and rear ends of said side members and the downwardly facing surface of said first restraining body being spaced upwardly from the lower surface of said side members so that a space is provided between the rear end of said first restraining body and the rear ends of said side members and between the downwardly facing surface of said first restraining body and the lower surface of said side members for seating a child with his legs located below the downwardly facing surface and projecting toward the front ends of said side members, said first restraining body being pivotally displaceable into the second position with said upwardly facing surface and downwardly facing surface extending upwardly when a sudden strong deceleration of the vehicle takes place, such as occurs in the case of an accident, wherein the improvement comprises a stationary second restraining body positioned between said side members and below said first restraining body, a horizontal first shaft pivotally mounting said first restraining body and extending between said side members adjacent the front ends thereof, said first restraining body being pivotally movable about said first shaft between the first and second positions thereof, said first shaft being positioned so that impact forces directed against said first restraining body in the second position thereof pass through said first shaft and a flywheel mass located in one of said first restraining body and said side members and arranged for automatically pivotally displacing said first restraining body from the first position into the second position upon a sudden strong deceleration of the vehicle.

4,190,289

NET HEADREST

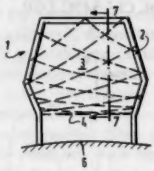
Matthias M. Brünig, Parchimer Strasse 23, 2000 Hamburg 73, and Herbert D. Stolle, Ruebenkamp 148, 2000 Hamburg 60, both of Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,109

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714796; Jan. 23, 1978, 2802850

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—391 **9 Claims**



1. A net headrest for a seat of a motor vehicle, with a frame attached to the seat and a net fastened to the frame, characterized by the fact that the frame is closed at least at the top and open on at least one side or the bottom and the net in the marginal area of the open side or the bottom of the frame is kept under high tensile stress, in comparison to the remaining net surface.

4,190,290

HEADREST FOR VEHICLE SEATS

Werner Strien, Stuttgart, Fed. Rep. of Germany, assignor to Recaro GmbH & Co., Kirchheim, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,831

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, 2801168

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—408 **12 Claims**

1. Device for setting elements which are pivotable relative to each other, especially for setting the pivotable upholstery support of a headrest for vehicle seats, comprising:

a first element formed as a pipe-like hollow tube;

a second element engaged with said first element and formed as at least one rod-like support bar;

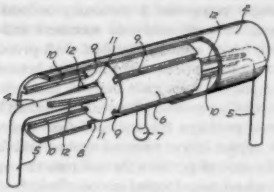
a setting member arranged in said first element so as to be longitudinally movable therein;

an activator device associated with said setting member to form an adjusting device; and

guide means for engaging said second element with said first element;

whereby a forced pivotal motion of at least one of the first

and second elements relative to the other is produced when the setting member is moved by the activator device



in the longitudinal direction of the first element relative thereto.

4,190,291

ADJUSTABLE HEADREST ASSEMBLY FOR AUTOMOTIVE VEHICLES

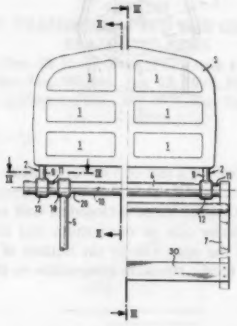
Heinz K. Korger, Niederstotzingen, Fed. Rep. of Germany, assignor to Carl Stahl GmbH & Co. KG, Gurt -und Bandweberei, Herbrechtingen, Fed. Rep. of Germany

Filed Sep. 13, 1977, Ser. No. 832,829

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641470

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—408 **16 Claims**



1. A mounting assembly for the headrest of an automotive vehicle including at least one seat with a seat back comprising: a padded body; arm means in fixed engagement with said padded body; a horizontal support member having a generally horizontally extending longitudinal axis; attachment means mounting said horizontal support member on said seat back to prevent pivotal movement thereof about said longitudinal axis; and connecting means mounting said padded body upon said horizontal support member to enable adjustable pivotal movement thereof about said longitudinal axis to a plurality of inclined positions; said connecting means including slot means defined in said horizontal support member and receiving said arm means therein for guided engagement therewith; said slot means comprising at least one longitudinal slot oriented to extend obliquely relative to said longitudinal axis, said at least one obliquely oriented slot engaging said arm means to guide said padded body for movement pivotally about said longitudinal axis when said padded body is moved longitudinally relative thereto thereby to enable said padded body to be adjustably pivotally moved to said plurality of said inclined positions.

4,190,292

PROCESS FOR SUPPRESSING DUST IN MINES

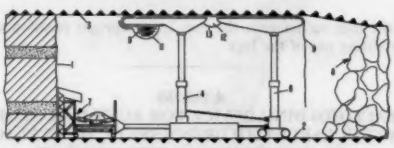
Harald Johannes, Duesseldorf; Günther Seifert, Cologne; Hans Lewer, Witten-Annen, and Dieter Poller, Dortmund, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 11, 1978, Ser. No. 895,449

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650675; Apr. 1, 1977, 2714569; Sep. 8, 1977, 2740447; Oct. 13, 1977, 2746005

Int. Cl.[2] E21D *23/00*

U.S. Cl. 299—12 **24 Claims**



1. A process for suppressing dust in a longwall mining operation, wherein advanceable support units are used to support the hanging walls of the mine while mining operations are being carried out on the face of the mine, which comprises:

advancing a leading edge of a sheet of dust impervious material, folded in a zigzag fashion, from a package of said sheet material mounted on an advanceable support unit positioned adjacent the mine face;

feeding said leading edge of said sheet between the support unit and a first portion of the hanging wall of the mine such that said sheet is unfolded and withdrawn from said package and temporarily pinned against the first portion of the hanging wall by the support unit;

advancing the support unit toward the mine face while maintaining said sheet material pinned against the first portion of the hanging wall, whereby an additional length of said sheet material is unfolded and withdrawn from said package and is temporarily pinned against a second portion of the hanging wall; and

repeating the foregoing steps, thereby pinning a further length of said sheet material to a third portion of the hanging wall, and releasing the portion of the sheet material pinned against said first portion of the hanging wall.

4,190,293

ROCK SPLITTING ATTACHMENT FOR A BREAKING HAMMER

Charles E. Nieder, 134 N. Lyons Valley Rd., Jamul, Calif. 92035

Filed Apr. 27, 1978, Ser. No. 900,708

Int. Cl.[2] E21C *37/02, 37/04*

U.S. Cl. 299—23 **9 Claims**

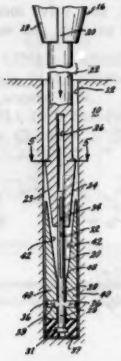
1. A rock splitting attachment for a breaking hammer comprising:

a primary shaft having first wedge means adjacent one of its ends, said first wedge means having a plurality of principal wedge surfaces on the outer surfaces of said primary shaft,

an elongated primary wedge assembly having second wedge means formed adjacent one of its ends, said second wedge means having a plurality of principal wedge surfaces on the interior surfaces of said elongated primary wedge assembly,

means for telescopically attaching said primary shaft to said elongated primary wedge assembly whereby when said primary shaft is driven axially toward said elongated primary wedge assembly while the elongated primary wedge assembly's axial movement has been restrained, said principal wedge surfaces of said primary shaft will contact and travel along said principal wedge surfaces of said elongated primary wedge assembly to be driven radially outwardly thus increasing the width of said elon-

gated primary wedge assembly with the result that the internal concussion and driving force exerted on said primary shaft by a breaking hammer is directed against the walls of a bore hole into which said rock splitting attachment has been inserted causing internal fractures in the rock, said means for telescopically attaching said primary shaft to said elongated primary wedge assembly comprises:



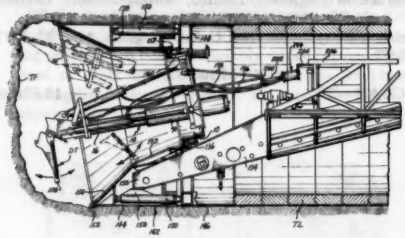
a bore in said primary shaft extending axially inwardly from that end of the primary shaft which has the first wedge means adjacent thereto, and a secondary shaft that forms a part of said elongated primary wedge assembly, the width of said secondary shaft being smaller than the width of said bore so that it may be telescopically received therein.

4,190,294

EXCAVATOR FOR USE IN A TUNNELING SHIELD

Tyman H. Fikse, Seattle, Wash., assignor to The Robbins Company, Seattle, Wash.

Filed Aug. 17, 1978, Ser. No. 934,511
Int. Cl.² E21D *9/08*
U.S. Cl. 299—33 **9 Claims**



1. An excavating mechanism for a tunneling machine that is advanced through the ground as excavating proceeds, of a type comprising a combination digging and dragging tool and a multipod support for said tool comprising a tool mounting head and at least three double-acting hydraulic cylinders forming three variable length support and drive legs, which are operable to extend and retract the tool and move it up and down and sideways over the tunnel face, and the improvement comprising:

a rotor which in use is supported within the tunneling machine for rotation about an axis which extends longitudinally of the tunnel;

means connecting the rear ends of the hydraulic cylinder support and drive legs to the rotor, said connecting means permitting only axial and thrust loads to be transmitted between said hydraulic cylinder support and drive legs and said rotor;

means for transmitting bending moments and torque loads from the tool support head back to the rotor; and

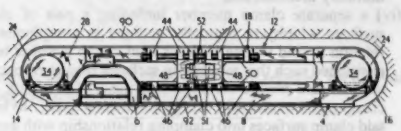
means for rotating said rotor to change the sideways attitude of the tool.

4,190,295

MINING MACHINES WITH CUTTER CHAIN TENSIONING MEANS

Gordon E. Boast, Burton-on-Trent, England, assignor to Coal Industry (patents) Limited, London, England

Filed Dec. 5, 1977, Ser. No. 857,455
Claims priority, application United Kingdom, Dec. 21, 1976, 53244/76
Int. Cl.² E21C *25/56*
U.S. Cl. 299—43 **7 Claims**



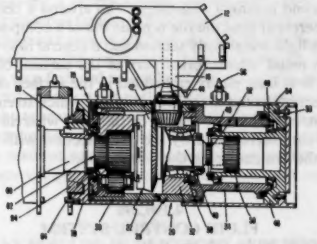
1. A mineral mining machine comprising a conveying track for cut mineral extending transversely to the direction of advance of the machine and disposed adjacent to a floor on which the machine is supported for advance over, a cutter member supported for vertical movement as a whole, the member including a guideway, the guideway having upper and lower runs extending generally parallel to the conveying track, an endless cutter chain supported by the upper and lower runs of the guideway, and a drive motor for the drive chain mounted on the member, wherein the invention comprises the guideway of the cutter member being divided centrally into two halves movable relatively with respect to one another, guide means on which the two halves are relatively movable, and fluid operable means interconnecting the halves of the guideway and actuable to effect the relative movement.

4,190,296

APPARATUS FOR INTERCONNECTING SEGMENTED CUTTER DRUMS OF A ROTARY CUTTER MECHANISM

Larry A. O'Dell, Columbus, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 13, 1978, Ser. No. 915,285
Int. Cl.² E21C *25/10*
U.S. Cl. 299—89 **10 Claims**



1. In a machine for cutting earth formations, of the type comprising a vehicle body, a cutter drum mounted on said vehicle body, and means for rotating said cutter drum, said cutter drum including a plurality of segments of a cylinder, and connector means connecting said drum segments together, the improvement wherein:

(a) said drum segments each include at one end thereof a reaction surface inclined in a direction extending longitudinally outwardly and radially inwardly; and
(b) said connector means comprising:
(i) a connector ring including an inner peripheral surface inclined in a direction complimentary to that of said reaction surfaces such that said connector ring is able to fit over said reaction surfaces,
(ii) fastener means for imposing generally longitudinally inward forces on said connector ring to urge said inner peripheral surface of said ring into wedging engagement with said reaction surfaces to urge said drum segments together,
(iii) a plurality of clamping means located adjacent an end of said drum opposite the end containing said reaction surfaces, each clamping means comprising a pair of side-by-side wedge members secured to respective ones of adjacently disposed drum segments, each wedge member including a wedge surface, said wedge surfaces being mutually inclined, and
(iv) a separate clamp member including a pair of clamp surfaces which are mutually inclined in complimentary relation to said wedge surfaces, said clamp member being positioned such that said clamp surfaces engage respective ones of said wedge surfaces, and means for urging said clamp member and said wedge members together to bring said clamp surfaces into clamping relationship with associated ones of said wedge surfaces to secure said drum segments together.

4,190,297

WHEEL FOR AIR OR GAS FILLED TIRES FOR MOTOR VEHICLES

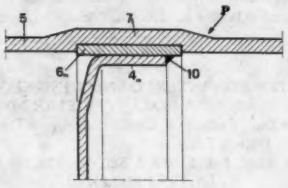
Walter Schmidt, Eigeltingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 25, 1978, Ser. No. 945,224

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745163

Int. Cl.[2] B60B *3/04, 23/00*

U.S. Cl. 301—63 R **9 Claims**



1. A wheel for air or gas filled tires to be used on motor vehicles and having a ring-shaped rim around a central wheel disc, wherein at least the rim is made out of a composite section having a light metal body section and a central insert of higher strength metal which forms part of the surface of the body section, is at least partly embedded in the surface of the composite section facing the wheel disc, and which strengthens the highly stressed central region of the rim, wherein the insert forms a ring surrounded by the body section with said insert ring of the rim enclosing the wheel disc.

4,190,298

FLUID CONTROL SYSTEM

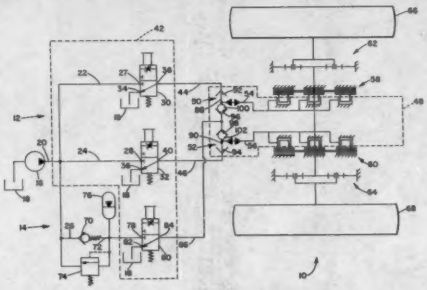
Lawrence R. Klope, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 17, 1978, Ser. No. 952,173

Int. Cl.[2] B60T *13/14*

U.S. Cl. 303—2 **14 Claims**

1. A fluid control system comprising: fluid function means; a primary source of pressurized fluid for said fluid function means; a fluid reservoir; a primary fluid control valve connected to said primary source and said fluid reservoir and operatively connected to said fluid function means selectively connecting said primary source to said fluid function means or said fluid function means to said fluid reservoir; a secondary source of pressurized fluid for said fluid function means; a secondary fluid control valve connected to said secondary source and to said fluid reservoir and operatively connected to said fluid function means selectively connecting said secondary source to said fluid function means or said fluid function means to said fluid reservoir; and valve means connected to and disposed between said primary and secondary fluid control



valves and said fluid function means responsive to a greater pressure of said pressurized fluid from said primary fluid control valve than from said secondary fluid control valve to block said fluid function means from said secondary fluid control valve and to connect said primary fluid control valve to said fluid function means, and responsive to a greater pressure of said pressurized fluid from said secondary fluid control valve than from said primary fluid control valve to block said fluid function means from said primary fluid control valve and to connect said secondary fluid control valve to said fluid function means.

4,190,299

BUSHES

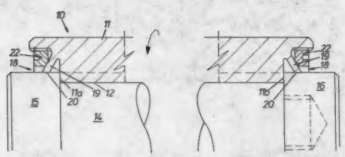
John E. Brown, Mansfield Woodhouse, England, assignor to West & Son (Engineers) Limited, Nottinghamshire, England

Filed May 26, 1978, Ser. No. 910,146

Claims priority, application United Kingdom, May 27, 1977, 22617/77

Int. Cl.[2] F16C *33/72*

U.S. Cl. 308—3.5 **13 Claims**



1. A bush for reception on a shaft, the bush having a body portion having an axially extending bore for rotatably receiving the shaft, an annular sealing formation located at least one axial end of the body portion for sealingly engaging the shaft, the sealing formation including an annular wall inclined relative to the axis of the body portion so as to project in opposite axial directions, one axial end of the wall defining an annular sealing surface for sealingly engaging the shaft and the opposite axial end of the sealing formation being sealingly attached to the end of the body portion from which the sealing formation projects, the body portion and the or each sealing formation being formed from a rigid material so that on axial

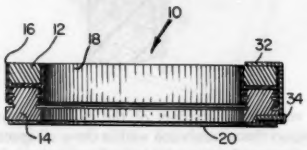
compression of the bush the wall of the or each sealing formation is deflected to urge its annular sealing surface into contact with the shaft.

4,190,300

BEARING FOR LINER-HANGER ASSEMBLY

Louis M. Scalzi, Laconia, N.H., assignor to New Hampshire Ball Bearings, Inc., Laconia, N.H.

Filed Nov. 13, 1978, Ser. No. 959,487
Int. Cl.[2] F16C *17/08*
U.S. Cl. 308—4 A **11 Claims**



1. An improved bearing assembly adapted for use in a liner-hanger assembly, which bearing assembly comprises:

(a) an upper cylindrical race element having a lower cylindrical surface;

(b) a lower cylindrical race element having an upper cylindrical surface and having adjoining inside and outside side surfaces;

(c) a load-bearing, low coefficient-of-friction bearing-liner material secured between the lower cylindrical surface of the upper race element and the upper cylindrical surface of the lower race element;

(d) inside and outside sealing-liner material secured to the inside and outside side surfaces of the lower race element; and

(e) inside and outside sleeve elements secured to and extending from the upper race element and extending parallel with the inside and outside liner material and into a close slidable and sealing relationship thereto, thereby providing an improved bearing assembly which prevents drilling mud or other debris from contacting the load-bearing bearing-liner material between the upper and lower race elements.

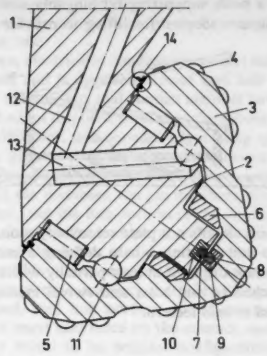
4,190,301

AXIAL BEARING FOR A ROLLER DRILL BIT

Leif Lachonius, Surte, and Dieter Becker, Hisings Backa, both of Sweden, assignors to Aktiebolaget SKF, Goteborg, Sweden

Filed Feb. 2, 1978, Ser. No. 874,324
Claims priority, application Sweden, Feb. 16, 1977, 7701680
Int. Cl.[2] E21B *9/10*
U.S. Cl. 308—8.2 **1 Claim**

1. A roller drill bit comprising a journal, a cutting roller rotatably supported on said journal by bearing means including an axial bearing comprising a cup-shaped metallic casing of a material softer than the cutting roller and shaft journal mounted in the axial end face of the shaft journal and a cup-shaped metallic casing of a material softer than the cutting roller and shaft journal mounted in the interior of the tip of the cutting roller, a diamond supported in each casing having



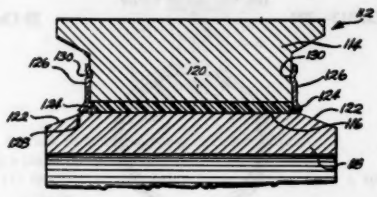
bearing surfaces in confronting engaging relation, each of said bearing surfaces being spherical.

4,190,302

SEALED LINED BEARINGS

William F. Lynn, and Gordon M. Walker, both of Renton, Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Continuation of Ser. No. 725,808, Sep. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 576,491, May 12, 1975, Pat. No. 4,055,369. This application Apr. 11, 1978, Ser. No. 895,331
Int. Cl.[2] F16C *33/74*
U.S. Cl. 308—36.1 **5 Claims**



1. A seal for a lined bearing comprising: a bearing having a cylindrical surface on the inner and on the outer races with the inner race having a tapered outer surface near each end; a bearing liner material tightly adhered to the cylindrical shaped surface on the outer race; a resilient seal material is located at a juncture between the outer race, the liner material, and the inner race; a ring fastened to a side of the outer race, said ring deflected outward to extend with ring inside diameter contacting one of the tapered outer surfaces of the inner race and the ring exerting pressure against the resilient seal material thereby holding the resilient seal material against the ring, the side of the liner material, and the outer surface of the inner race.

4,190,303

TABLE FOR USE IN RELIGIOUS SERVICES

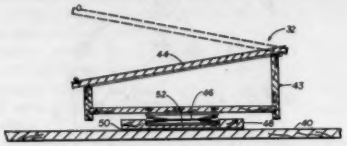
Juanita W. Ellis, Rte. 1, Box 399-A, Henderson, Ky. 42420

Filed Jul. 5, 1978, Ser. No. 921,898
Int. Cl.[2] A47B *19/00*
U.S. Cl. 312—33 **6 Claims**

1. A table for use in religious services and otherwise comprising

a multi-sided table top, and

a rotatable lectern removably mounted on said table top for rotation into alignment with each of the sides of said top, said lectern comprising, wall structure defining a chamber therein, a book supporting lid hingably attached to said wall structure adapted for lifting to provide external ac-



cess to said chamber, a plate removably mounted on said table top and forming a base defining a recess therein, swivel means disposed at least partially within said recess and attached to said base, said swivel means also being connected to said lectern.

4,190,304

APPARATUS FOR USE IN THE CONSTRUCTION AND DECORATION OF UPHOLSTERED FURNITURE AND THE LIKE

Robert J. Schneider, 479 Geneva Rd., Glen Ellyn, Ill. 60137

Continuation of Ser. No. 728,429, Sep. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 581,757, May 29, 1975, abandoned. This application May 10, 1978, Ser. No. 904,551

Int. Cl.[2] A47B *95/04*

U.S. Cl. 312—204 **20 Claims**

1. A decorative modular furniture trim unit adapted to be combined with a plurality of other trim units to form a composite decorative design of a size for attachment to a surface of an article such as upholstered furniture, cabinets and wall panels and attachable with nails having decorative heads to such an article said trim unit comprising two joining portions and a decorative portion extending between and connecting said joining portions, each of said joining portions being shaped to mate with and be substantially complementary to the other of said joining portions of said unit and to joining portions of other units, said joining portions and said decorative portion having a normally hidden underside which engages the article when in use, said decorative portion further including a normally viewed top side having a decorative design and being optionally variable relative to said other units in respect to size and design, said trim units being adapted to be joined with said plurality of other trim units and with the mating and complementary joining portions in engagement, and said decorative portions cooperating with said decorative heads of said nails to form said composite decorative design.

4,190,305

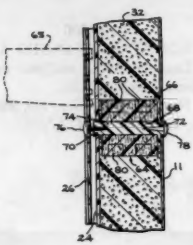
STRUCTURAL SUPPORT FOR A REFRIGERATOR

J. Nelson Knight, Louisville, Ky., and Roger C. Turner, Milwaukee, Wis., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 749,087, Dec. 9, 1976, Pat. No. 4,107,833. This application May 22, 1978, Ser. No. 908,471

Int. Cl.[2] F25D *11/00;* **B65D** *25/14;* **F16B** *37/04*

U.S. Cl. 312—214 **5 Claims**



1. In a refrigerator cabinet of the type employing insitu foamed polyurethane insulation within the wall space between the panel members forming the inner liner and the outer case, a strong, rigid, structural support which comprises:

a body formed by fibrous material with pre-formed holes in the body which facilitates thorough impregnation of the foam material and bonded to one of the panel members to lend support thereot, and

a screw anchor embedded in the body of the impregnated fibrous material and extending through an aperature in the panel member.

4,190,306

DRAWER WITH STOP DEVICE

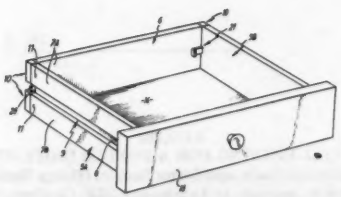
Leon G. Litchfield, and Terence Hardy, both of Derby, England, assignors to L. B. (Plastics) Limited, Derby, England

Filed Apr. 3, 1978, Ser. No. 892,741

Claims priority, application United Kingdom, Apr. 6, 1977, 14495/77; Jul. 23, 1977, 31040/77

Int. Cl.[2] A47B *88/00*

U.S. Cl. 312—330 R **18 Claims**



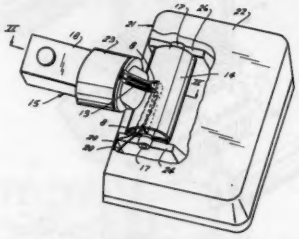
1. A drawer comprising back and side panels, the side panels incorporating runner grooves and the back and side panels being of hollow construction interconnected by corner pieces having projections engaged in the hollow portions of the associated panels, and a fitment removably mounted at one end of said back panel and retained against removal when the back panel an the associated side panel are assembled, said fitment including a portion which extends across the runner groove in the side panel.

4,190,307

ADAPTER

Manfred Eckart, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Aug. 11, 1978, Ser. No. 932,917
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737013
Int. Cl.² H01R 39/00
U.S. Cl. 339—6 R 19 Claims



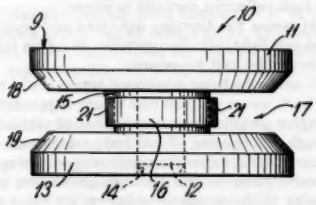
1. An adapter, particularly for detachably connecting an electrical floor-treating device to an operating appliance, comprising a first housing having a first longitudinal axis, a first throughgoing passage and a second throughgoing passage separated from said first passage, a first end portion adapted to be connected to the operating appliance, and a second end portion longitudinally spaced from said first end portion; a second housing having a second longitudinal axis extending substantially transverse to said first axis of said first housing and a third portion adapted to be mounted on said second end portion of said first housing for rotation relative thereto and about said first axis, said second housing being further provided with one through-going passage corresponding to and adapted to communicate with said first passage of said first housing when the latter is connected to said second housing to thereby define an uninterrupted first channel through the adapter, and another throughgoing passage having an open end communicating with said second passage of said first housing when the latter is connected to said second housing and another end open outwardly of said second housing so as to define a second uninterrupted channel through the adapter; and means for mounting said second housing on the treating device for pivotal movement relative thereto about said second axis and for rotational movement with the treating device about said first axis.

4,190,308

FEMALE ELECTRICAL CONNECTOR

James Iantorno, Mamaroneck, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,407
Int. Cl.² H01R 31/08
U.S. Cl. 339—19 18 Claims



1. An electrical connector for electrically connecting a pair of spaced apart, substantially parallel, electrically conductive pin members comprising:

a housing formed of an electrically nonconductive material and having a pair of opposed, spaced apart cover members and a central hub portion disposed between the cover members; and

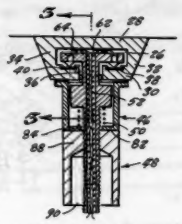
a continuous, electrically conductive contact member which is resilient and is disposed around said hub portion in a loose fit relationship, said contact member having a pair of opposed edges disposed parallel to the mounting direction of the connector, said opposed edges being spaced apart a distance greater than the distance between said spaced apart pin members such that when the connector is pushed over said pin members, the pin members resist said pushing action, and the hub portion of the connector housing exerts a force on the lead portion of said contact member to effect an elongation of said contact member thus reducing the pushing force required to overcome the resistance of said pin member and such that when said pushing action is stopped, said hub portion of the connector housing ceases to exert said force on the contact, and the contact tends to revert to its original configuration to effect a secure interference fit and electrical connection between the pins and contact member.

4,190,309

TRACK LIGHT

Irving J. Glass, 64-85 Wetherole St., Forest Hills, N.Y. 11374

Filed Jul. 27, 1978, Ser. No. 928,443
Int. Cl.² H01R 9/00, 13/60
U.S. Cl. 339—21 R 8 Claims



1. A track light comprising, in combination:

(a) a track including:

(1) an elongated housing for mounting onto a support surface;

(2) a T-shaped channel formed in said housing and having a transverse slot with a lower wall and an open groove formed in said lower wall;

(3) a pair of laterally spaced, parallel conductor strips, partially embedded into said lower wall on opposite sides of said groove; and

(4) inwardly turned shoulders formed in said lower wall and overhanging the edges of said conductor strips; and

(b) an adjustable lighting fixture, including:

(1) a contacting member having a hollow post externally threaded on at least a portion thereof, a cross bar connected across one end of the post having a length less than the width of said channel and a width less than the width of said groove, a pair of mutually insulated conical contacts depending from said cross bar and laterally spaced on either side of said post for separably engaging a respective conductor strip, and an axial collar coupled to said post in spaced relationship from said cross bar with an axial keyway formed in said collar;

(2) a T-shaped cover member having a transverse plate with a cylindrical body depending therefrom, an inwardly turned radial flange at the lower end of said cylindrical body defining a central opening through which said shaft can extend, an axial key inwardly

extending from said cylindrical body and mating with said keyway for non-rotative engagement with said contacting member, locking pads upwardly extending from said transverse plate and laterally positioned with respect to said cylindrical body for extending into said groove to prevent rotation of said T-shaped cover member with respect to said track;

(3) a threaded cap member threading onto said post axially outward of said cover member for axially moving said cover member along said post, and

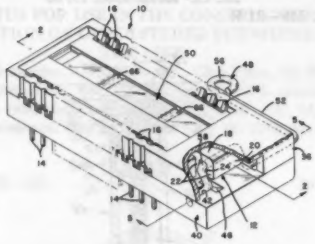
(4) a spring spacedly positioned around said post within said cylindrical body and extending between said collar and said flange for biasing said cover member away from said cross bar to permit insertion of said cross bar through said groove and then upon rotation, into said channel, whereupon said cap member can tighten said lighting fixture onto said track with said locking pads in said groove and said conical contact firmly contacting said conductor strips.

4,190,310

EJECTION DEVICE FOR A ELECTRONIC PACKAGE CONNECTOR

Edward J. Bright, Elizabethtown; Gabriel B. Cherian, York, and William S. Scheingold, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 3, 1978, Ser. No. 892,522
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 R **22 Claims**



18. An ejector device for use on a connector into which an electronic package may be removably inserted, the device comprising;

a. an elongated, resilient member positioned on the connector with a first end fixed to the connector, with at least part of the mid-portion positioned to underlie an electronic package which may be removably inserted in the connector and with the second end free to move towards the first end; and

b. means for causing the resilient member to bow upwardly so that the mid-portion pushes against the electronic package in a direction away from the connector.

4,190,311

LOW-PROFILE TEST CLIP ADAPTER

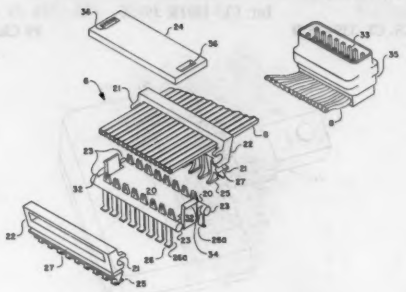
Thomas P. Basta, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 883,983, Mar. 6, 1978, abandoned. This application Feb. 26, 1979, Ser. No. 14,794
Int. Cl.[2] H05K *1/04*; H01R *13/54*
U.S. Cl. 339—75 MP **6 Claims**

1. A low-profile clip for making electrical connection to the terminals of a multi-terminal electronic component while the component is operating in an instrument having closely spaced circuit boards, the device comprising:

a cable comprising a plurality of insulated electrical conductors for carrying electrical signals from a test instrument to the electronic component being tested;

a body having spaced electrical contact means rigidly mounted therein, said electrical contact means including inwardly-directed, arcuate-shaped terminal-contact sections for providing electrical connection with the terminals of the electronic component and conductor-connecting sections for making electrical contact with said plurality of electrical conductors of said cable; and



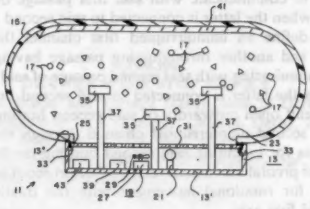
a pair of arms pivotally mounted on said body and comprising finger-like projections for gripping the electronic component between each pair of adjacent terminals thereof, the top portion of each of said arms including a slot for passing said cable therethrough.

4,190,312

LIGHT DISPLAY MEANS

Lonnie E. Bailey, 335 Marianna, Memphis, Tenn. 38111

Filed Sep. 1, 1978, Ser. No. 938,805
Int. Cl.[2] G02B *27/08*
U.S. Cl. 350—4.2 **2 Claims**



1. Light display means comprising:

(a) base means;

(b) hollow translucent body means for being mounted on said base means, said body means having an opening for communicating with said base means;

(c) a plurality of magnetically attractable, light reflective particles for being positioned within said body means;

(d) fan means for blowing air into said body means to cause said light reflective particles to move;

(e) light means for directing light into said body means to cause said light reflective particles to reflect light as they are moved by said fan means;

(f) grill means for being positioned between said opening of said body means and said base means to prevent said light reflective particles from passing out of said body means through said opening of said body means; and

(g) electromagnet means for selectively attracting said light reflective particles, said electromagnet means including a plurality of electromagnet members for being positioned within said body means and for selectively attracting said light reflect particles, said electromagnet means including

control means for selectively activating each of said electromagnet members.

4,190,313

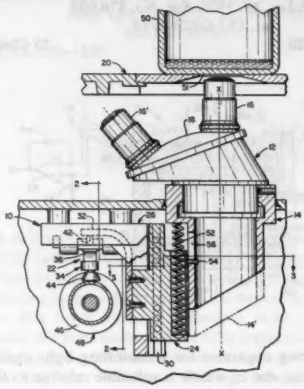
SUPPORT FOR A MICROSCOPE OBJECTIVE

Richard P. Schultz, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 17, 1978, Ser. No. 906,544

Int. Cl.² G02B *21/00*

U.S. Cl. 350—84 **8 Claims**



1. A support for an objective of a microscope having a focusing mechanism with objective attachment means thereon for moving said objective toward and away from a stage of the microscope to adjust said objective relative to a specimen to be observed on said stage, said support comprising:

a carrier for said objective;

means for slideably mounting said carrier on said attachment means, said mounting means permitting sliding movement of said carrier on said attachment means toward and away from said stage of said microscope independently of movement of said attachment means, said separate movements of said carrier and attachment means being in substantially parallel directions;

a stop limiting the extent of said independent movement of said carrier on said attachment means;

means for yieldingly biasing said carrier against said stop;

whereby said objective with said attachment means may be moved toward and away from said stage by operation of said focusing mechanism while said objective is afforded protection against damaged by yielding of said biasing means to forces unduly resisting such movement and sliding of said carrier on said attachment means in a direction parallel to the direction of movement of said attachment means.

4,190,314

MICROSCOPE AND MICROSCOPE SLIDE FOR CYTOLOGICAL ANALYSIS

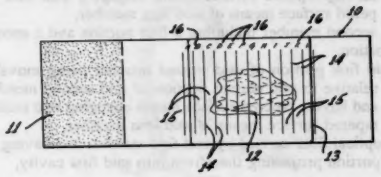
Stephen Goldsmith, 104 Lee Ave., Babylon, N.Y. 11702

Continuation of Ser. No. 657,096, Feb. 11, 1976, which is a continuation of Ser. No. 378,984, Jul. 13, 1973, abandoned. This application on Jan. 11, 1978, Ser. No. 868,535

Int. Cl.² G02B *21/34*

U.S. Cl. 350—94 **11 Claims**

1. In combination with a microscope having a field of view of a predetermined diameter, a microscope slide comprising a thin elongated flat generally transparent strip having means for accurately designating adjacent fields of view and comprising a plurality of visible adjacent spaced-apart parallel lines formed on and extending over almost all of a flat surface of said strip, each of two adjacent equidistantly spaced-apart lines of said plurality of lines defining one of a plurality of uninterrupted scanning spaces having a width substantially equal to the diameter of the field of view of the microscope viewing device for viewing a cytological smear on the slide wherein said means enables a viewer by visually making reference to adjacent lines defining each of said plurality of said scanning



spaces to view the entire area of a smear by successive contiguous viewing scans of said scanning spaces, the spacing between each of two adjacent spaced-apart lines being approximately 1 mm, whereby a viewer making a viewing pass along all of said plurality of scanning spaces overlying a smear is ensured of detecting even a single malignant cell in a smear.

4,190,315

LIGHT TRANSMISSION GUIDES

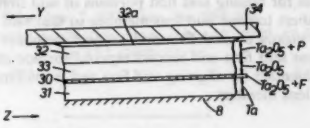
Jack Brettle, Nether Heyford, and Norman F. Jackson, Duston, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Continuation-in-part of Ser. No. 675,561, Apr. 9, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,789

Claims priority, application United Kingdom, Apr. 10, 1975, 14697/75

Int. Cl.² G02B *5/14*; C25D *5/00*

U.S. Cl. 350—96.12 **35 Claims**



1. A light transmission guide comprising an anodic film of light transmitting material having a first anodised portion with a relatively high refractive index and at least a second portion with a relatively low refractive index, in which anodic film the increase in refractive index from said relatively high to said relatively low value is smooth and continuous in the vicinity of an interface between said first and second anodised portions, and in which the outer surface of said anodic film possesses a minimum amount of structural discontinuity on an atomic scale.

4,190,316

LENS CONNECTOR FOR OPTICAL FIBERS

Marc W. Malsby, Lake Arrowhead; John S. Doty, Yucaipa, and Jayantilal N. Patel, Beaumont, all of Calif., assignors to The Deutsch Company, Banning, Calif.

Filed Feb. 2, 1978, Ser. No. 874,558

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.18 **44 Claims**

16. An optical fiber connector comprising

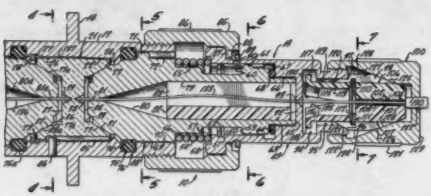
a lens member having first and second opposite ends,

said first and second ends including first and second cavities, respectively,

said cavities being opposite from each other,

said first and second ends having first and second tapered surface means, respectively,

a first member adjacent said first end of said lens member,
a second member adjacent said second end of said lens member,
said first member including a first portion and a second portion,
said first portion of said first member being movable relative to said second portion of said first member and having tapered surface means engaging said first tapered surface means of said lens member,
said second member including a first portion and a second portion,
said first portion of said second member being movable relative to said second portion of said second member and having tapered surface means engaging said second tapered surface means of said lens member,
a first optical fiber carried by said first member and having an end portion projecting therefrom into said first cavity,



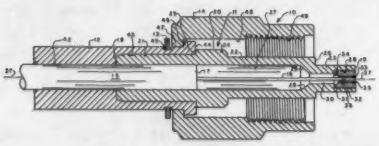
a second optical fiber carried by said second member and having an end portion projecting therefrom into said second cavity,
said first and second members including means for gripping said first and second fibers, respectively, only at locations remote from the ends thereof and so that the ends of said fibers are pressed axially into said cavities,
and means for connecting said first and second members to said lens member, said connecting means including resilient means for biasing said first portions of said first and second members toward said lens member so that said tapered surface means of said first and second members are pressed against said first and second tapered surface means of said lens member for aligning said first and second members with said lens member.

4,190,317

FIBER OPTIC CABLE CONNECTOR PIN ASSEMBLY

John A. Makuch, Danbury, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Dec. 30, 1977, Ser. No. 866,198
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.20 **14 Claims**



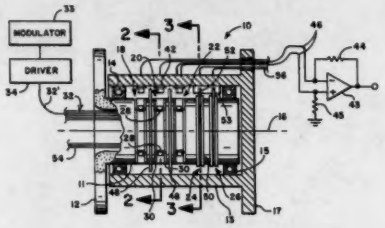
1. An assembly for aligning and terminating at least one optical fiber of a fiber optic cable along a predetermined axis comprising:
a rigid body having a uniformly cylindrical bore dimensioned for receiving said optical fiber and having a center axis in common with said predetermined axis; and
a compressible insert member having a greater outer dimension than the diameter of said bore and having a central aperture dimensioned for receiving said optical fiber, said compressible insert member being tapered along at least a portion of its length and being adapted for forced insertion into said bore and being substantially uniformly compressed by said bore for substantially uniformly reducing the dimension of said central aperture about said optical fiber to thereby firmly grip said optical fiber in aligned and terminated position along said predetermined axis.

4,190,318

OPTICAL SLIP RING APPARATUS UTILIZING RADIAL LIGHT SIGNALS

Robert W. Upton, Jr., Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 19, 1978, Ser. No. 870,968
Int. Cl.² G02B 5/16
U.S. Cl. 350—96.20 **20 Claims**



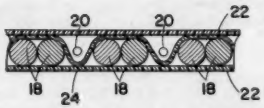
1. Optical slip ring apparatus for transmitting light signals between two bodies, one of which is rotatable relative to the other about an axis of rotation, comprising:
a first light source for emitting a first radial light signal throughout a continous ring in a first plane;
a first member adapted to be fixed to one of the relatively rotatable bodies, and adapted to carry said first light source so that said ring is centered on the axis of rotation and the first plane is perpendicular to the axis of rotation;
a first light detector; and
a second member adapted to be fixed to the other of the relatively rotatable bodies, and adapted to carry said first light detector so that it is positioned to receive radial light signals emitted by said first light source.

4,190,319

FIBER OPTIC RIBBON AND CABLE MADE THEREFROM

Frederick C. Eggleston, Decatur, Ill., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Feb. 13, 1978, Ser. No. 877,047
Int. Cl.² G02B 5/16
U.S. Cl. 350—96.23 **9 Claims**



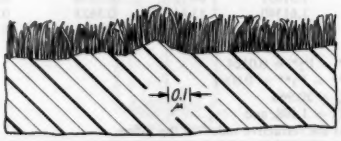
1. An optical ribbon, comprising:
pair of parallel, elongated, substantially co-planar strength members extending parallel to the axis of said ribbon;
an optical channel situated in the void between said strength members, said optical channel being located in the same plane as said strength members and extending parallel to the axis of said ribbon;
a pair of parallel, elongated polymeric tapes bonded to one another only at their edges so as to form a sheath surrounding said sstrength members and optical channel, said sheath being bonded to said strength members; and

the relative size of said strength members and said optical channel being such that bonding between said sheath and optical channel is substantially prevented, and the spacing between said strength members being such that said channel is substantially free to move relative to said strength members and sheath.

4,190,320
PROJECTION SCREEN
Jesus Ferro, 425 Demody St., Roselle, N.J. 07203
Filed Oct. 24, 1978, Ser. No. 954,214
Int. Cl.[2] G03B *21/60*
U.S. Cl. 350—129 **15 Claims**

1. A front projection screen comprising a rear backing layer, a filler layer of flexible deformable material having its rear surface bonded to said backing layer, first and second metallic reflecting layers separated from each other by a light transmissive film layer, the first reflecting layer being maintained against the front surface of the filler layer, and a light-diffusing surface layer coated on the front surface of the second metallic reflecting layer to define a viewing surface, said viewing surface having a crosshatched pattern comprising a plurality of intersecting sets of parallel grooves formed therein so that images reflected from said screen can be viewed over a given range of viewing angles.

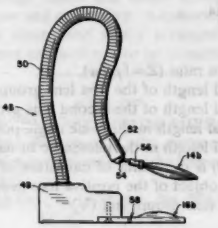
4,190,321
MICROSTRUCTURED TRANSMISSION AND REFLECTANCE MODIFYING COATING
Gary L. Dorer, Taunton, Mass., and Valdis Mikelsons, Mendota Heights, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Feb. 18, 1977, Ser. No. 770,043
Int. Cl.[2] G02B *1/10*
U.S. Cl. 350—165 **14 Claims**



1. An article having a substantially antireflecting surface such that the specular reflection of visible light directed thereat is appreciably reduced, said article comprising

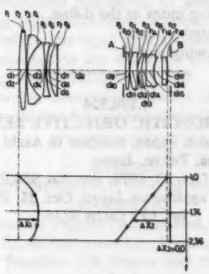
a substrate having a surface coating of an oxide of a metal selected from the group consisting of aluminum, magnesium and zinc or alloys thereof, which coating is a substantially complete conversion of a thin-film of said metal, the thickness of said thin-film prior to conversion being at least 5 nanometers and exhibiting a surface after said conversion characterized by a plurality of randomly positioned discrete leaflets of varying heights and shapes, which leaflets extend from said surface a distance of not less than 20 nanometers nor more than the wavelength of light, and the bases of which contact the bases of substantially all adjacent leaflets.

4,190,322
MAGNIFYING MEANS
Stewart W. Wortley, 1814 S. Cheyenne, Tulsa, Okla. 74119
Filed Sep. 1, 1977, Ser. No. 823,932
Int. Cl.[2] G02B *13/12*
U.S. Cl. 350—181 **4 Claims**



1. Magnifying means comprising a first magnifying element constructed of a plastic material which magnifies in one direction only and having one flat surface and one arcuate surface oppositely disposed with respect thereto, a second magnifying element having at least one arcuate surface and which magnifies in all directions for cooperating with the first magnifying element and means for infinitely varying both of said elements with respect to spacing and angular orientation therebetween for facilitating focusing and to produce relatively high power magnification.

4,190,323
WIDE ANGLE ZOOM LENS WITH HIGH ZOOM RATIO
Ryota Ogawa, Kawagoe, and Takayuki Itoh, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 7, 1978, Ser. No. 894,275
Claims priority, application Japan, May 13, 1977, 52-55046
Int. Cl.[2] G02B *15/16*
U.S. Cl. 350—184 **4 Claims**



1. In a photographic zoom lens system including relatively movable first divergent and second convergent lens groups on the object and image side, respectively, the improvements characterized by:

(a) the first lens group including at least two positive and two negative lenses, with the image side lens being positive,

(b) the second lens group including at least two positive lens facing the object,

(c) a fixed aperture diaphragm positioned on the image side of the second lens group, and

(d) the overall lens system satisfying the following conditions:

$$Z = 2.36, \quad \text{(I)}$$

$$\frac{|f_1|}{\sqrt{f_W f_T}} = 1.135, \quad \text{(II)}$$

$$\frac{f_2}{f_T} 0.604, \quad \text{(III)}$$

$$r_I = 1.4414, \quad \text{(IV)}$$

wherein:

Z is the zoom ratio ($Z = f_T/f_W$),

f_1 is the focal length of the first lens group,

f_2 is the focal length of the second lens group,

f_W is the focal length in the wide angle position,

f_T is the focal length in the telescopic or narrow angle position, and r_I is the radius of curvature of the lens surface facing the object of the positive lens nearest to the image in the first lens group, and (V)

	1 : 3.5–4.5 Surface No.	f = 1.0–2.36 r	ω = 38.4°–17.6° d	N	ν
first lens group	1	5.0189	0.1563	1.58913	61.1
	2	−30.5650	0.0035		
	3	4.7923	0.0590	1.80610	40.9
	4	0.8060	0.3439		
	5	−9.3508	0.0521	1.78650	50.2
	6	2.1211	0.0778		
	7	1.4414	0.1580	1.76180	27.1
	8	25.5287	1.5274		
second lens group	9	3.3349	0.0858	1.77250	49.6
	10	−6.2150	0.0035		
	11	1.1636	0.1691	1.52630	51.1
	12	7.3634	0.0035		
	13	0.6434	0.0973	1.51823	59.0
	14	1.1888	0.0913		
	15	4.9821	0.1744	1.84666	23.9
	16	0.6116	0.1688		
	17	3.4938	0.1320	1.54072	47.2
	18	−1.2504			

wherein:

r_i is the radius of curvature of the ith lens surface,

d_i is the thickness of the ith lens or the distance between adjacent lenses,

N is the refractive index at the d-line,

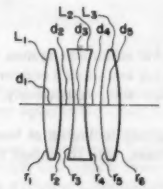
ν is the Abbe' number, and

ω is the half viewing angle.

4,190,324
ACHROMATIC OBJECTIVE LENS

Yasunori Arai, Asaka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1978, Ser. No. 954,032
Claims priority, application Japan, Oct. 21, 1977, 52-126578
Int. Cl.² G02B 9/16
U.S. Cl. 350—226 **1 Claim**



1. An achromatic objective lens comprising: positive, negative and positive lenses, a first positive lens L_1, a negative lens L_2 and a second positive lens L_3, satisfying the following conditions:

(1) $40 < \nu_2 < 45$
(2) $P_2^* < 0.5700$, $P_2^{**} > 0.3300$
(3) $\nu_1 > \nu_2 + 15$
(4) $|\nu_3 - \nu_2| < 5$
(5) $P_3^* - P_2^* > 0.005$, $P_2^{**} - P_3^{**} > 0$
(6) $0.15\ f < -f_2 < 0.5\ f$
(7) $0.5 < f_1/f_3 < 2.0$

where:

ν_i is the Abbe's number of the lens L_i,

P_i^* is the partial dispersion ratio of short wavelength part of the lens L_i, where:

$$P^* = \frac{n_g - n_F}{n_F - n_C}$$

and n_g, n_C and n_F are the refractive indexes corresponding to g-line (436 nm), C-line (656 nm) and F-line (486 nm) of the optical glass material, respectively,

P_i^{**} is the partial dispersion ratio of long wavelength part of the L_i, where:

$$P^{**} = \frac{n_C - n_{A'}}{n_F - n_C}$$

and $n_{A'}$, n_C and n_F are the refractive indexes corresponding to A'line (768 nm), C-line and F-line of the optical glass material, respectively,

f is the overall focal length, and

f_i is the focal length of the lens L_i and the lens system further defined as follows:

Lens	f = 100.0 Surface	F No. 1 : 12 Distance along optical axis
L_1	$R_1 = 55.2096$	
	$R_2 = -28.8000$	$d_1 = 1.000$
		$d_2 = 0.049$
L_2	$R_3 = -28.5730$	
	$R_4 = 23.5163$	$d_3 = 0.417$
		$d_4 = 0.097$
L_3	$R_5 = 22.6201$	
	$R_6 = -79.7936$	$d_5 = 1.000$

	n_d	ν	P^*	P^{**}
L_1	1.51633	64.15	0.5350	0.3582
L_2	1.61340	43.84	0.5623	0.3373
L_3	1.53256	45.91	0.5747	0.3312

$P_3^* - P_2^* = 0.0124$
$P_2^{**} - P_3^{**} = 0.0061$
$-f_2 = 20.966$
$f_1/f_3 = 1.108$, and
n_d is the refractive index on the d-line.

4,190,325
THERMAL COMPENSATOR ASSEMBLY

Isabel L. Moreno, Oceanside, Calif., assignor to Ford Motor Company, Dearborn, Mich.

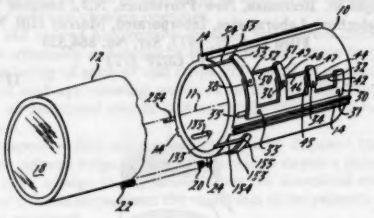
Continuation-in-part of Ser. No. 856,699, Dec. 2, 1977. This application Nov. 13, 1978, Ser. No. 960,155
Int. Cl.² G02B 7/02
U.S. Cl. 350—253 **7 Claims**

1. In an optical system comprising:

a first lens barrel supporting at least one lens element along an optical axis;

a second lens barrel supporting a second lens element, wherein said second lens barrel is float mounted on said first lens barrel for adjustable movement along said optic axis with respect to said first lens barrel;

an improved optical compensator assembly comprising:
an elongated support member, having a relatively low linear coefficient of expansion, connected to said first lens barrel at a single point so as not to restrict thermal expansion and contraction of said first lens barrel in response to ambient temperature changes;
a first lever having a relatively low linear coefficient of expansion, one end pivotally mounted on said support



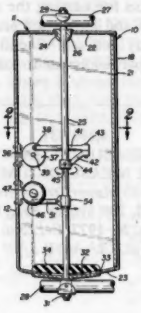
member and a second end located for movement along an arc segment generally parallel to said optic axis; and
a first push rod having a relatively high linear coefficient of expansion, having a first end abutting against said support member and a second end abutting an intermediate point between said ends of said first lever, wherein;
said second end of said first lever member communicates with said floating lens barrel to effect movement thereof greater than the linear expansion of said first push rod.

4,190,326

MOTOR CONTROLLED MIRROR POSITIONING APPARATUS

Robert Brodbeck, P.O. Box 806, Littleton, Colo. 80120

Filed Aug. 7, 1978, Ser. No. 931,870
Int. Cl.[2] G02B *5/08, 7/18*
U.S. Cl. 350—289 **3 Claims**



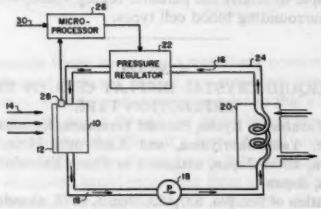
1. Vehicle rear view mirror positioning apparatus, for making mirror adjustments in rotary and tilt positions for the planar mirror, mounted in a housing having one transparent wall facing the mirror surface, comprising:
(a) generally rectangular housing means having one transparent wall and at least one metal wall,
(b) mounting means for said housing including a pair of generally horizontal arms depending outwardly from the vehicle,
(c) rear view mirror means mounted in said housing,
(d) mirror mounting means including a shaft secured between said arms and extending through said housing means interconnected with said rear view mirror means and arranged to tilt said housing means and said rear view mirror in one plane and rotate said housing means and said rear view mirror in another plane, said housing means being pivotally mounted to the top of said shaft for tilting and rotational movement,
(e) a pair of individually activated motors mounted in said housing, and
(f) linkage means separately interconnecting said one metal wall and said housing means and said rear view mirror, one said linkage means and motor arranged to tilt said housing means and said mirror on actuation, and the other said linkage means and motor arranged to rotate said housing means and said mirror on actuation.

4,190,327

DEFORMABLE LIQUID MIRROR

Richard S. Hughes, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1978, Ser. No. 951,533
Int. Cl.[2] G02B *5/10*
U.S. Cl. 350—310 **9 Claims**



1. A liquid laser mirror for reflection of light comprising:
a working liquid that reflects said laser light;
a pressure cell with an inlet and an outlet for containing said working liquid as it flows through said cell under predetermined pressure;
an optical plate transparent to said laser light which is within said pressure cell and oriented to face incoming laser light where said optical plate has been polished to eliminate scatter of light from the surfaces of said optical plate;
a pressure regulator connected to said pressure cell for controlling said predetermined pressure of liquid in said pressure cell by the input flow to said pressure cell;
a pump connected to the outlet of said pressure cell for circulating said working liquid; and
a heat exchanger connected between said pump and said pressure regulator for cooling said working liquid.

4,190,328

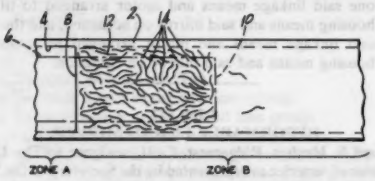
PROCESS FOR DETECTION OF BLOOD-BORNE PARASITES

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437; James V. Massey, III, 80 Driftwood La., Trumbull, Conn. 06610, and Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Dec. 1, 1978, Ser. No. 965,591
Int. Cl.[2] G02B *00/00*
U.S. Cl. 350—320 **6 Claims**

1. A method for visually detecting the presence of a particular parasite in a sample of anticoagulated blood, said method comprising the steps of:
(a) substantially filling a transparent capillary tube with a sample of whole blood to be tested for parasite infestation;
(b) centrifuging said blood sample in said tube to cause any parasites present in said blood sample to settle into a defined layer due to the specific gravity of the parasites;
(c) providing a generally cylindrical body in said capillary tube during said centrifuging step to form a narrow annular free space within said tube, said free space being radially bounded inwardly by the outer surface of said body

and outwardly by the bore wall of said tube into which free space at least a significant portion of said layer of the parasites settles during centrifugation whereby the population density of said portion of said layer of parasites is substantially increased to render the presence of parasites



in the blood sample readily discernable under appropriate optical magnification; and

(d) differentially highlighting the parasites in the blood sample to render the parasites highly visible with respect to surrounding blood cell types.

4,190,329

LIQUID CRYSTAL DISPLAY CELL OF THE REFLECTION TYPE

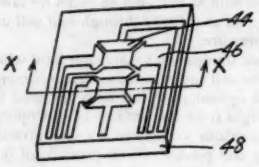
Isamu Washizuka, Kyoto; Satoshi Teramura, Kashihara; Shinji Tsugei, Yamatokoriyama, and Kazuyoshi Hirayama, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

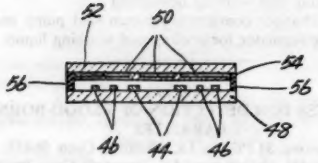
Continuation of Ser. No. 637,453, Dec. 3, 1975, abandoned. This application Feb. 22, 1978, Ser. No. 880,162

Claims priority, application Japan, Dec. 3, 1974, 49-138974

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—338 **5 Claims**





1. A liquid crystal display cell of the reflection type comprising:

a. a rear substrate;

b. segment shaped reflection electrodes and lead wires thereof formed on the rear substrate;

c. a transparent front substrate through which the display cell is viewed;

d. a reflection film formed in direct surface engagement on the transparent substrate, the reflection film covering the area of said lead wires on said rear substrate, but being removed at the positions corresponding to the segment shaped reflection electrodes formed on the rear substrate;

e. a transparent electrode formed uniformly over said transparent substrate and said reflection film directly engaging said transparent substrate only over that portion thereof from which said reflection film is removed;

f. a spacer for providing a predetermined distance between said two substrates; and

g. a liquid crystal composition filled between said two substrates; whereby said reflection film is viewed without intervention of said transparent electrode.

4,190,330

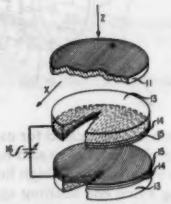
VARIABLE FOCUS LIQUID CRYSTAL LENS SYSTEM

Dwight W. Berreman, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1977, Ser. No. 864,328

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—331 **11 Claims**



1. Optical device comprising a variable focus optical focusing system consisting essentially of a first body of an essentially uniformly transparent birefringent nematic liquid crystal material, a second body of an essentially uniformly transparent birefringent liquid crystal material, means for aligning the directors in said first body in a first direction, means for aligning the directors in said second body in a second direction which is essentially perpendicular to said first direction, a pair of electrodes or an induction coil for applying across said first body and said second body an electric or magnetic field having a component perpendicular to said first direction and said second direction, means for varying the strength of said electric or magnetic field, and means for providing light passing through said first body and said second body and having a component which is perpendicular to said first direction and said second direction.

4,190,331

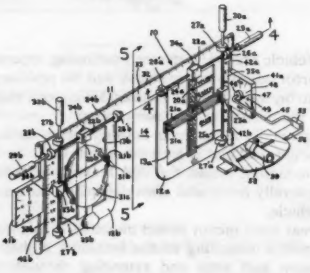
OPHTHALMIC MEASURING INSTRUMENT WITH ANGLE MEASURING MEANS

William V. Padula, II, 10 Manor Dr., Milford, Conn. 06460, and William V. Padula, I, 299 Manor Ave., Cranford, N.J. 07016

Filed Jun. 24, 1977, Ser. No. 809,536

Int. Cl.[2] A61B *3/10*

U.S. Cl. 351—5 **2 Claims**



1. An ophthalmic measuring instrument to be detachably connected to the eyeglass frame of a patient in front of the lens area in said eyeglass frame comprising,

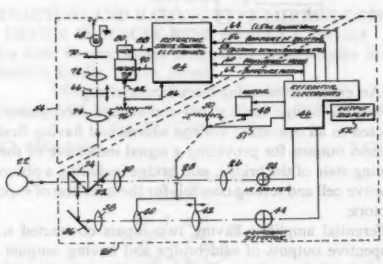
a. an instrument frame having a front, a back, spaced eye viewing openings and a medially disposed nose opening,
b. clip means on the back of said frame for detachably connecting the instrument frame to the eyeglass frame of the patient so that the eye viewing openings are disposed substantially in front of and in alignment with the lens area of said eyeglass frame,
c. first and second vertically disposed transparent colored strips adjustably connected to the instrument frame to permit indexing of each of said strips in front of an associated one of said eye viewing openings,
d. first and second horizontally disposed transparent colored strips adjustably connected to the instrument frame to permit indexing of each of said strips in front of an associated one of said eye viewing windows in intersecting relation with an associated one of said vertically disposed colored strips,
e. the respective first and second horizontally disposed transparent colored strips having a color which causes a perceptive color change to the patient when the associated transparent colored strips bisect the visual axis of the patient's eye being measured,
f. graduated upper markings on the front of said frame having a center point to enable the said frame to be aligned with the center of the eyeglass frame to which it is attached and operatively associated with the first and second vertically disposed transparent colored strips to enable an MVA distance measurement to be made whenever either of said vertically disposed transparent colored strips bisect the visual axis of a given eye of the patient,
g. a first and second set of graduated markings on the front of said frame operatively associated with the first and second horizontally disposed transparent colored strips to permit the vertical displacement between the patient's respective eyes to be measured when the horizontally disposed transparent colored strips are in the visual axis of the patient, and
h. angle measuring means detachably connectable to said instrument frame for measuring the vertical inclination and vergence of each respective eye of the patient.

4,190,332

METHOD AND APPARATUS FOR CONTROLLING VISUAL REFRACTIVE STATE OF THE EYE

Richard H. Body, Centreville, and Edwin W. Evers, Reston, both of Va., assignors to Acuity Systems, Incorporated, Reston, Va.

Filed Oct. 14, 1977, Ser. No. 842,173
Int. Cl.² A61B 3/10
U.S. Cl. 351—13 **26 Claims**



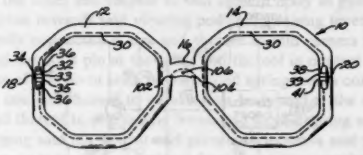
1. Apparatus for controlling the refractive state of an eye, said apparatus comprising:
a visual target;
an optical system for presenting an image of said target to said eye;
refraction means for objectively and substantially instantaneously determining said eye's refractive condition;
means coupled to said refraction means and to at least one of said target and said optical system for moving said image to a plane axially offset from the retina of said eye, said offset being in such a direction that when said eye attempts to focus on said image, the refractive state of said eye will change toward the desired goal; and
means for varying the position of said image to attract and maintain the interest of said eye.

4,190,333

SPECTACLE FRAMES

Raymond E. Lambert, North Attleboro, Mass., assignor to Lambert Anodizing Co. Inc., Attleboro, Mass.

Filed Jan. 16, 1978, Ser. No. 869,636
Int. Cl.² G02C 1/08, 5/14, 5/22, 5/12
U.S. Cl. 351—95 **14 Claims**



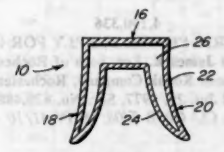
1. A spectacle frame comprises a main body portion having a front, sides and back and having two eye wires joined by a bridge portion, a slit formed in each eye wire so that a lens can be inserted and clamped therein, an upper barrel attached to each eye wire above the slit and a lower barrel attached to each eye wire below the slit and two T-bar members each having an elongated barrel projecting from a front plaque, the elongated barrel extending through a respective slit with the plaque disposed contiguous to the eye wire above and below the slit on the front side of the main body portion, the upper, lower and elongated barrels being aligned and having a bore extending therethrough, fastening means extending through the bore in the barrels to clamp the eye wires and T-bar members together and temple means attached to the frame.

4,190,334

NOSE PAD FOR EYEGLASS FRAMES

Roderick J. O'Neil, 655 Main St., Waltham, Mass. 02154

Filed Aug. 28, 1978, Ser. No. 937,489
Int. Cl.² G02C 5/02
U.S. Cl. 351—137 **6 Claims**



1. A nose piece for use with a pair of eyeglasses having a bridge extending between the lenses of said eyeglasses, comprising
(a) an inverted U-shaped hollow member adapted to contain a charge of fluid sealed therein,
(b) said member formed with a hollow cross-portion mountable to said bridge and a pair of spaced, depending curved hollow legs extending one from each end of said cross-portion to engage the nose of a person wearing said eyeglasses,
(c) the walls of said member being of an imperforate elastic material and the inner opposing walls of said legs being thinner than the outer walls thereof whereby said inner walls will expand and contract with changes in the pressure of said fluid to change the gap between said legs, and,
(d) squeezing means engaging said cross-portion for selec-

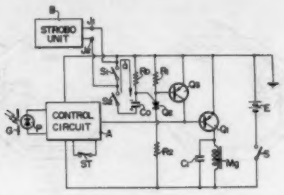
tively compressing said cross-portion to vary the pressure of said fluid.

4,190,335

SHUTTER CONTROLLING AID MEANS FOR USE WITH CAMERA

Yoshihisa Maitani, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Oct. 13, 1977, Ser. No. 841,948
Claims priority, application Japan, Oct. 16, 1976, 51-24154
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—34 **10 Claims**



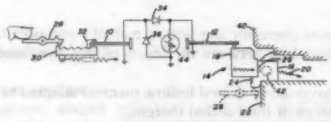
1. In combination:
a strobo unit;
an electrical shutter circuit and X contacts for operating said strobo unit, said X contacts being adapted to close during initiation of a photographing operation, said electrical shutter circuit including terminating means for terminating said photographing operation;
said strobo unit including flash means and power means for powering said flash means;
means for releasably electrically connecting said strobo unit to said electrical shutter circuit;
said flash means being illuminated responsive to closing of said X contacts;
said electrical shutter circuit being comprised of resistor-capacitor storing means being connected across said X contacts and charged by said strobo unit power means when said strobo unit is coupled with said electrical shutter circuit and said X contacts are open and being discharged upon closure of said X contacts to produce a closing signal indicating closure of said X contacts; and
said terminating means being responsive to said closing signal for terminating the photographing operation.

4,190,336

PIEZOELECTRIC POWER SUPPLY FOR CAMERAS

Lee F. Frank, and James K. Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,488
Int. Cl.[2] G03B *7/08*; H01V *41/10*
U.S. Cl. 354—50 **3 Claims**



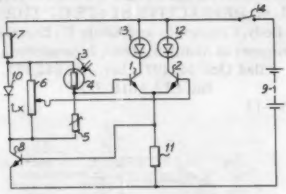
1. In photographic apparatus having (1) an aperture, (2) shutter means for selectively opening and closing the aperture to provide an exposure period, and (3) electrically energizable photoelectric means, including a piezoelectric charge storage device, for controlling the shutter means to vary the exposure period in accordance with scene luminance, the improvement comprising:
(a) charge generating means including a flexible piezoelectric member which is adapted to generate and store charge of one polarity upon being flexed toward a predetermined flexed configuration, and to generate and store charge of opposite polarity upon unflexing from said flexed configuration toward a relaxed configuration;
(b) actuating means for repeatedly flexing said member toward said flexed configuration and for allowing said member, between successive flexures, to unflex from said flexed configuration toward said relaxed configuration;
(c) means electrically connecting said piezoelectric member and said charge storage device for transferring charge of said one polarity to said storage device when said member is flexed toward said flexed configuration;
(d) means for preventing transfer of charge of said one polarity from said charge storage device to said piezoelectric member when said member unflexes from said flexed configuration toward said relaxed configuration; and
(e) means for discharging charge of said opposite polarity from said piezoelectric member when said member unflexes from said flexed configuration toward said relaxed configuration.

4,190,337

EXPOSURE MEASUREMENT CIRCUIT

Siegfried Schütze, and Werner Locke, both of Dresden, German Democratic Rep., assignors to VEB Pentacon Dresden Kamera- und Kinowerke, Dresden, German Democratic Rep.

Filed Jan. 30, 1978, Ser. No. 873,623
Claims priority, application German Democratic Rep., Jan. 31, 1977, 197151[U]
Int. Cl.[2] G03B *17/18*; G01J *1/44*
U.S. Cl. 354—60 L **7 Claims**

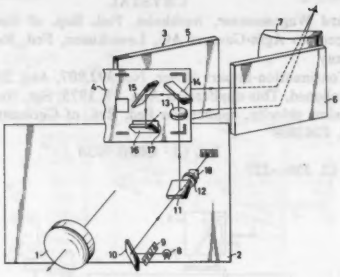


1. An exposure metering circuit comprising:
a measuring bridge having first and second feed points connected to an operating voltage source and having first and second outputs for providing a signal indicative of the balancing state of the bridge, said bridge including a photoconductive cell and setting controls for the insertion of exposure factors;
a differential amplifier having two inputs connected to the respective outputs of said bridge and having outputs connected to light emitting elements for the indication of a set under exposure, over exposure or correct exposure condition;
and wherein the first feed point of said measuring bridge is connected to the operating voltage source via a resistor and the second feed point of said bridge is connected to the operating voltage source via the collector-emitter path of a transistor which transistor is driven at its base by means of a voltage derived from the common emitter circuit of the differential amplifier, to provide compensation for circuit fluctuations.

4,190,338
DATA RECORDING CAMERA

Youichi Okuno, Yokohama; Hideo Yokota, Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 943,355
Claims priority, application Japan, Sep. 21, 1977, 52-114345; Sep. 21, 1977, 52-114347
Int. Cl.[2] G03B *17/24, 13/02*
U.S. Cl. 354—106 5 Claims

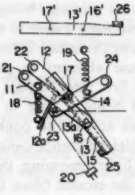


1. A data recording camera comprising:
an image forming optical system for forming the image of the object to be photographed on the photosensitive material;
a view finder optical system for observing the object to be photographed;
means forming data;
a light beam dividing device for directing the light beam from the data toward the photosensitive material and the view finder optical system, said dividing device producing a ghost light beam forming on the photosensitive material a ghost image of the data being produced due to the internal reflection of said light beam dividing device;
an optical system for forming the data image on the photosensitive material;
an optical system for forming the data image in the view finder; and
an optical member arranged in the path of the ghost light beam to substantially eliminate the ghost light beam.

4,190,339
RETRACTING AND RAISING TYPE MIRROR DRIVE DEVICE IN SINGLE-LENS REFLEX CAMERA

Akihiro Arai, Urawa, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,262
Claims priority, application Japan, May 31, 1977, 52-63548
Int. Cl.[2] G03B *19/12*
U.S. Cl. 354—156 5 Claims

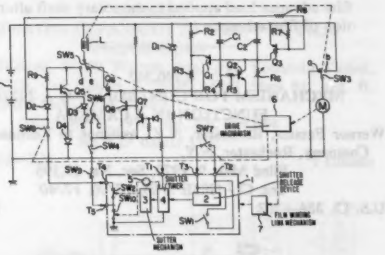


1. A mirror drive device for a single lens reflex camera of the type in which a mirror is movable between viewing and photographing positions, is mounted on a mirror supporting member within a camera body and is simultaneously pivoted and retracted out of the optical photographing path and into the photographing position in order to expose the camera lens to the photographic film, the device comprising:
first and second pivot shafts provided on said camera body and fixed in position with respect to said camera body, first and second coupling shafts provided on said mirror supporting member along a single edge thereof and first and second pivot arms, said first pivot arm being pivotally connected at one end thereof to said first pivot shaft and at the other end thereof to said first coupling shaft and said second pivot arm being pivotally connected at one end thereof to said second pivot shaft and at the other end thereto to said second coupling shaft, a first spring means coupled at one end thereof to one of said pivot arms and at the other end thereof to said camera body to pull said mirror towards said viewing position, a raising lever pivotally connected at one end thereof to said camera body and having a pin at the other end thereof in contact with one of said pivot arms, and a second spring means coupled at one end thereof to said camera body and at the other end thereof to said raising lever, said second spring means urging said pin against said pivot arm to move said pivot arm so as to raise said mirror from the viewing position to the photographing position.

4,190,340
MOTOR DRIVE APPARATUS FOR PHOTOGRAPHIC CAMERA

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 2, 1977, Ser. No. 847,920
Claims priority, application Japan, Nov. 5, 1976, 51/132312
Int. Cl.[2] G03B *1/18*
U.S. Cl. 354—173 8 Claims

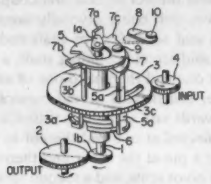


1. A motor drive apparatus for a camera for starting shutter release upon the turning on of a trigger switch, for starting film winding upon receipt of an exposure completion signal from said camera upon a completion of exposure and for generating a signal upon completion of film winding, comprising:
(a) a timer circuit adapted to start counting elapsed time upon receipt of said exposure completion signal from the camera and to generate a timer signal after the lapse of a predetermined period; and
(b) shutter release means adapted to generate a release signal and to start shutter release when said film winding completion signal is produced and said timer signal is generated.

4,190,341
MOTOR DRIVE DEVICE FOR CAMERA

Shiro Sugimori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 851,745
Claims priority, application Japan, Nov. 22, 1976, 51-139489
Int. Cl.[2] G03B 1/18
U.S. Cl. 354—173 5 Claims

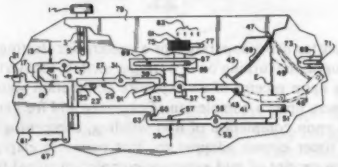


1. A motor drive device for a camera comprising:
a film advance shaft for advancing film with the aid of a drive from a motor,
a rotary shaft having a connecting portion and effective to transmit its rotation to said film advance shaft;
a drive plate rotatably mounted on said rotary shaft and rotatable by the drive from said motor;
a movable plate rotatably mounted on said rotary shaft;
resilient drive connection means between said drive plate and said movable plate so as to rotate them together, the resilient drive connection means allowing a relative rotation of the drive plate when the movable plate is stopped;
a coupling member pivotally mounted on said movable plate and being movable between a coupled position in which said coupling member is coupled to said rotary shaft so that the rotary shaft rotates in unison with said drive plate through said coupling member and a non-coupled position in which said coupling member and said rotary shaft are free from each other;
change-over means for changing over said coupling member from said non-coupled position to said coupled position by actuating said coupling member; and
a release member provided on said drive plate so as to pivotally move said coupling member to said non-coupled position when said movable plate in said coupled position is stopped through the coupling member by an increased film advance load applied to the rotary shaft after completion of film advance.

4,190,342
MECHANISM FOR CONTROLLING A TIMED FUNCTION IN A CAMERA

Werner Fassler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 9, 1979, Ser. No. 19,195
Int. Cl.[2] G03B 9/08, 17/00, 17/40
U.S. Cl. 354—202 8 Claims

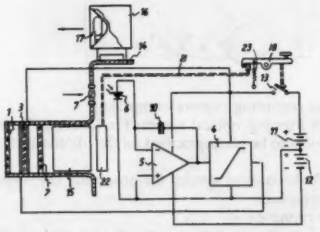


1. A mechanism for controlling a timed function in a camera, comprising:
means for initiating the timed function;
means operable for terminating the timed function;
means dampeningly oscillatable, beginning at selectable different amplitudes, in response to initiation of the timed function, and, after dampening for respective different intervals of time, oscillating at a predetermined lesser amplitude for operating said terminating means to terminate the timed function; and
means for selecting the amplitude at which said oscillatable means is to begin oscillating.

4,190,343
PHOTOGRAPHIC CAMERA WITH EXPOSURE CONTROL UTILIZING A PHASE CONTROLLABLE CRYSTAL

Eduard Wagensonner, Aschheim, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 392,807, Aug. 23, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,326
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1972, 2242809
Int. Cl.[2] G03B 9/56
U.S. Cl. 354—227 7 Claims



1. An exposure-terminating arrangement for photographic cameras capable of making flashbulb exposures, the arrangement comprising, in combination, a pair of parallel planar polarization filters, a planar phase element located intermediate the filters and parallel thereto, the filters and the phase element being arranged in the path of light entering the camera normal thereto, the phase element having two control electrodes and being operative for rotating the polarization direction of polarized light passing therethrough in dependence upon the potential difference across its two control electrodes, a light-integrating device operative for receiving scene light and generating an integral signal corresponding to the time integral of the received light, and a threshold detector circuit having an input connected to the light-integrating circuit for receipt of the integral signal and having a pair of output terminals, each control electrode of the phase element being connected only to a respective one of the threshold detector circuit output terminals and the operation of the phase element accordingly being determined exclusively by the potential difference across the threshold detector circuit output terminals, the threshold detector circuit being capable of assuming only two states, the first being a state in which it applies across the control electrodes of the phase element a potential difference causing the phase element to permit polarized light emerging through the first filter to pass also through the second filter, the second being a state in which the threshold detector circuit applies across the control electrodes of the phase element a potential difference causing the phase element to prevent polarized light emerging through the first filter from passing through the second filter, the threshold detector being in the first state when the integral signal is below a predetermined value, the threshold detector assuming its second state and accordingly causing the phase element to terminate the exposure when the integral signal reaches the predetermined value, whereby when the integral signal quickly reaches the predetermined value due to high flashbulb scene

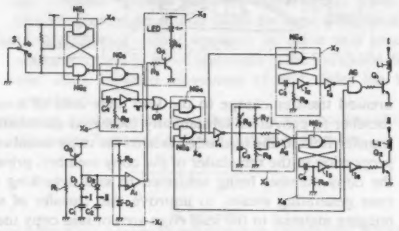
brightness levels the exposure can be immediately terminated without dependence upon the response times of moving parts.

4,190,344

DRIVING CIRCUIT FOR CAMERA SHUTTERS

Yasuo Ishiguro, and Kenji Wakazono, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 859,194
Claims priority, application Japan, Dec. 27, 1976, 51-159906
Int. Cl.[2] G03B *9/08*
U.S. Cl. 354—234 **2 Claims**



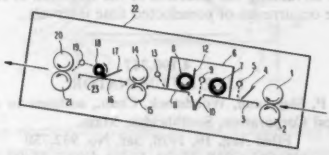
1. A driving circuit for camera shutters comprising:
a first driving coil for selectively opening a shutter;
a first capacitor;
means for selectively charging said first capacitor;
means, responsive to control signals applied thereto and including a switching element, for controllably providing a first current path to discharge said first capacitor through said first driving coil;
a voltage judging circuit, connected to said first capacitor, for generating a comparison signal indicative of whether the voltage of said means for selectively charging said first capacitor is above a predetermined value or not; and
a controlling circuit connected between said voltage judging circuit and said switching element, for, responsive to said comparison signal, generating a control signal to said switching element to render said switching element conductive when the voltage of said first capacitor is above the predetermined value to effect provision of said first current path;
a second driving coil for selectively closing said shutter;
a second capacitor;
means for selectively charging said second capacitor;
means, responsive to control signals applied thereto and including a second switching element, for controllably providing a second current path to discharge said second capacitor through said second driving coil;
a first one-shot multivibrator (0SM) circuit connected to said controlling circuit;
a first flip-flop (FF) circuit connected to said first OSM circuit and operated by the shutter releasing operation; and
an indicating circuit connected to said judging circuit and responsive to said comparison signal for generating indicia of when said first capacitor is below said predetermined value;
said controlling circuit comprising a two input OR gate having a first input thereto connected to said first OSM circuit and the second input thereof receptive of said comparison signal; and
a second FF circuit connected to said OR gate;
a second OSM circuit and first inverter connected to said second FF circuit;
an exposure timing controlling circuit connected to said first inverter;
a third OSM circuit connected to said exposure time controlling circuit;
a second inverter connected to said second OSM circuit;
an AND gate connected to said second inverter and said third OSM circuit, said AND gate supplying said control signal to said first switching element to effect opening of said shutter; and
a third inverter connected to said third OSM circuit, said third inverter supplying control signals to said second switching element to effect closing of said shutter.

4,190,345

LITHOGRAPHIC PLATE PROCESSING APPARATUS

Alfred S. Taylor, Fortunes Rocks, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Jul. 14, 1978, Ser. No. 924,653
Int. Cl.[2] G03D *5/04*
U.S. Cl. 354—318 **3 Claims**



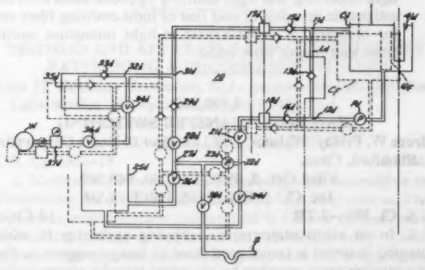
1. In a lithographic plate processing apparatus which comprises means for moving an exposed lithographic plate through the apparatus on an uphill slope, developer means within the apparatus for applying a developer liquid to the plate as it moves through the apparatus, and gumming means within the apparatus for applying gum to the plate after it has been developed, the gumming means including a baffle member under which the plate passes in contact to enter the gumming means and which forms a dam to hold a puddle of gum on the plate and against the baffle member, and spray means for spraying the gum onto the plate at the downstream end of the gumming means whereby the gum flows downhill over the upwardly moving plate, the improvement comprising, as part of the gumming means, a rotatable gumming scrub brush between the baffle member and the spray means and in a position to scrub the plate when it passes thereunder after passing through the puddle of gum and before passing the spray means:

4,190,346

AUTOMATED CLEAN-OUT SYSTEM FOR FILM PROCESSORS

John W. Hutson, 10250 Warner Ave. #H, Fountain Valley, Calif. 92708, and Robert L. Neal, 16911 Sims St. Apt. B, Huntington Beach, Calif. 92649

Filed Dec. 4, 1978, Ser. No. 966,084
Int. Cl.[2] G03D *3/02*
U.S. Cl. 354—324 **7 Claims**



1. In a film processor including a developer and fixer container the improvement comprising:
an automated clean-out system adapted to be connected to

the circulation loops around said developer and fixer containers of a film processor, including;

a first and second check valve respectively installed in said loops around said developer and fixer containers;

quick disconnect means installed directly in said loops adjacent said first and second check valves;

first and second conduit means respectively connected to said quick disconnects each said conduit means including a corresponding pump and valving means for selecting the direction of flow therethrough;

a first and second level detector respectively connected to said developer and fixer containers for sensing the level of liquids therein; and

automated sequencing means connected to said valving means, said pump and said first and second level detectors, said sequencing means including a first and second timer for advancing the selection of the direction of flow upon the occurrence of preselected time intervals.

4,190,347

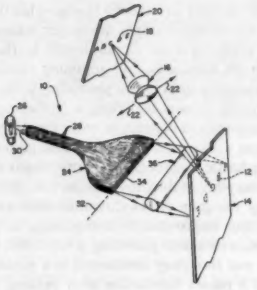
LINE ILLUMINATOR

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 10, 1978, Ser. No. 932,750

Int. Cl.[2] G03B *27/00, 27/54;* G03G *15/00*

U.S. Cl. 355—1 **8 Claims**



5. In an illuminator for a linescanning document copier including a light source, a bundle of light-conducting fibers having light-receiving ends tightly grouped in a generally circular array adjacent said light source and light-emitting fiber ends juxtapositioned along a straight line spaced from a document to be copies; the improvement comprising:

cylindrical lens means in said space between said light-emitting ends of said fibers and said document, said cylindrical lens means being in directly forwardly spaced relationship from said line of light-emitting fiber ends and extending approximately parallel to said line, said lens means having light-receiving and light-emitting opposite sides affording astigmatic imaging of said line of light-emitting fiber ends for blending of irregularities of light intensities emitted from said line of fiber ends.

4,190,348

LEAD EDGE TRANSFER SWITCHING

Bruce W. Friday, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

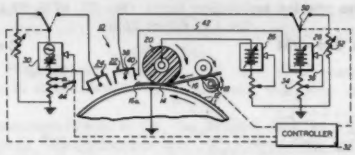
Filed Oct. 2, 1978, Ser. No. 948,069

Int. Cl.[2] G03G *15/16;* H01T *19/04*

U.S. Cl. 355—3 TR **14 Claims**

1. In an electrostatographic copying apparatus in which imaging material is transferred from an image support surface to a moving copy member by electrical transfer means including an electrical power supply, which transfer means applies electrostatic fields for said transfer of the imaging material and deposits electrostatic charges on the copy member which electrostatically resist the stripping of the copy member from said image support surface; and in which copying apparatus detacking corona generating means are also provided for at least partially neutralizing said charges deposited on the copy member by said transfer means so as to assist in the stripping of the lead edge of the copy member from said image support surface; the improvement comprising:

transfer switching means for applying a non-uniform in-



creased transfer charge to the lead edge area of a copy member to provide a substantially increased electrostatic transfer field to the lead edge area of the copy member in proportion to the remainder of the copy member, prior to the copy member being subjected to said detacking corona generating means, to improve said transfer of said imaging material to the lead edge area of said copy member.

4,190,349

SLIDER RECIPROCATING DRIVING APPARATUS FOR USE WITH ELECTROPHOTOGRAPHIC COPYING MACHINE

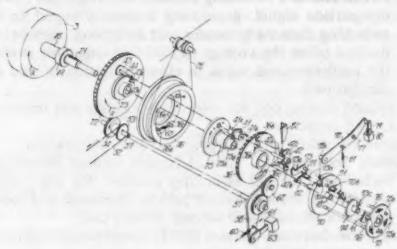
Yukihiro Ohno, Maebashi, and Nobuyuki Yanagawa, Chigasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 1, 1978, Ser. No. 911,412

Claims priority, application Japan, Jun. 2, 1977, 52-65122; Jun. 7, 1977, 52-66931

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **9 Claims**



1. A slider reciprocating driving apparatus for controlling reciprocating movement of a slider having a contact glass thereon for use with an electrophotographic copying machine of the type in which one copy is obtained by two revolutions of a photoconductor drum, said apparatus comprising, in combination, a drum shaft mounting said photoconductor drum, rotation operation means rotatably mounted on said drum shaft, and which reciprocates said slider with one reciprocating cycle of said slider corresponding to two revolutions of said photoconductor drum,

rotating means fixedly mounted on said drum shaft, and having a first notch in the peripheral surface thereof,

rotation control means rotatably mounted on said drum shaft, and having a second notch in the peripheral surface thereof,

stopper means comprising a rotatable shaft, rotatably mounted on said rotation operation means and disposed parallel to said drum shaft, and two ratchet pawls fixedly

mounted on said rotatable shaft, one ratchet pawl being engageable with said notch of said rotating means and the other ratchet pawl being engageable with said notch of rotation control means,

forward driving means operable to drive said rotating means to move said slider in the forward direction,

engagement means operable to engage said two ratchet pawls with said first notch of said rotating member and said second notch of said rotation control member, respectively, when said slider is to be moved forwards,

disengagement means operable to disengage said two ratchet pawls from said notch of said rotating member and that of said rotation control member, respectively, when the forward movement of said slider has been completed,

backward driving means operable to drive said rotating means reversely to move said slider in the backward direction when forward movement of said slider has been completed, and

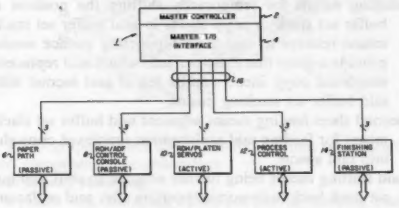
releasing means operable to disengage said backward driving means from said rotation operation member.

4,190,350

DISTRIBUTED MICROPROCESSOR CONTROL SYSTEM FOR A COPIER/DUPLICATOR

James J. Donohue, 9 Trailwood Cir., Brighton, N.Y.; Kenneth Gillett, 140 Via Sego, Redondo Beach, Calif. 90277; Charles P. Holt, 4400 Via Pavion, Palos Verdes Estate; Andrew T. Ling, 5203 Silver Arrow Dr., Rancho Palos Verdes, both of Calif. 90274; Richard M. Malinich, 28 Kevin Dr., Penfield, N.Y. 14526, and Frank M. Nelson, 14547 Valley Vista Blvd., Sherman Oak, Calif. 91403

Filed Aug. 30, 1977, Ser. No. 829,015
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 R **31 Claims**



1. A distributed processing system for reproduction machine, said machine producing copies of original documents and having a plurality of operating stations and a plurality of devices for controlling operational tasks within said operating stations, comprising:

a. a master programmable controller having program storage means for storing an operational program for controlling said machine,

b. at least one programmable area controller said programmable area controller being distinct from said master controller, said programmable area controller having program storage means for storing an operational program for controlling at least one of said devices,

c. at least one non-programmable area controller for controlling at least one of said devices; and

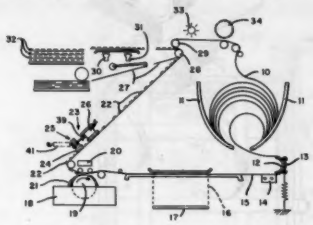
d. bus means coupling said programmable area controller and said non-programmable area controller with said master controller for transmitting and receiving data between said master controller and said programmable and non-programmable area controllers to control said operating tasks of said operating stations whereby to enable said machine to produce copies.

4,190,351

COPYING MACHINE WITH ELECTROMECHANICAL SCAVENGER ASSEMBLY AND PROCESS

Paul J. Macaluso, Norwalk, and Lawrence E. Clifford, Danbury, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 13, 1978, Ser. No. 960,587
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 **12 Claims**



1. In an electrostatic copying apparatus comprising a continuous photoresponsive master, means for moving said master through a copying cycle comprising a charging station in which the photoresponsive surface of the master is provided with an electrostatic charge, an exposure station in which the charged surface is exposed to the light image of an imaged original sheet being copied, whereby the electrostatic charge is removed from said surface except in latent image areas exposed to the imaged areas of said original, a development station in which said latent image areas are developed by means of toner powder present in a two-component composition comprising said toner powder and magnetic carrier particles, and an image-transfer station in which said developed images are transferred to a copy sheet and fused thereon, the improvement which comprises a non-magnetic shield having a collection surface which is positioned parallel to and across the path of the master and uniformly closely-spaced from the toner-imaged surface of said master, said shield being located beyond said development station and in advance of said transfer station, a magnet assembly pivotally attached to the apparatus and comprising a magnet which is movable between working and retracted positions, means for pivoting said magnet assembly to move said magnet into working position behind said shield to create a sufficient magnetic field through said shield to attract any magnetic carrier particles which may be present on the surface of said photoresponsive master from said master to the adjacent collection surface of said shield, and means for pivoting said magnet assembly into retracted position to move said magnet away from said shield to remove said magnetic field from said shield sufficiently to cause said magnetic particles to be released from the collection surface of the shield.

4,190,352

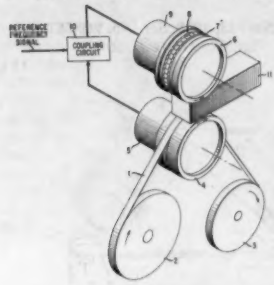
METHOD AND APPARATUS FOR CONTINUOUSLY PATTERNING A PHOTOSENSITIVE TAPE

John H. Bruning, Brookside, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 30, 1977, Ser. No. 811,971
Int. Cl.[2] G03B *27/32, 27/10, 27/70*
U.S. Cl. 355—19 **14 Claims**

1. Method for continuously patterning a photosensitive tape comprising the steps of: continuously projecting onto said tape a predetermined endless pattern that is defined entirely on the cylindrical surface of a transparent cylindrical body; translating said tape at a predetermined speed between a tape-feeding means and a tape-receiving means; rotating said body at said predetermined speed via a direct drive to synchronously lock the movements of said body and said tape to each other; optically coupling an optical system between said pattern and said tape; and illuminating said pattern through said transpar-

ent body for continuously projecting an image of said pattern onto said tape via said optical system; *wherein said optical system is characterized by a high-precision lens resolution relative*



to the surface of said tape, and the movements of said body and said tape are synchronously locked to each other by means of electrical circuit locking techniques to within the lens resolution of said optical system.

4,190,353

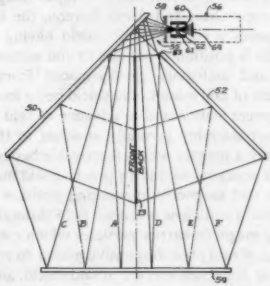
OPTICAL SYSTEM FOR ROTARY CAMERA

Mervin W. LaRue, Jr., Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 27, 1978, Ser. No. 955,666

Int. Cl.[2] G03B *27/32*

U.S. Cl. 355—24 **20 Claims**



1. A microfilm recording apparatus for filming documents comprising:

(a) a camera having a lens with an optical axis, and film,

(b) a base structure,

(c) document transport means to move the documents past an aperture area such that the plane of the document portion in the aperture area is substantially perpendicular to the base structure

(d) a combining mirror mounted to the base plate substantially perpendicular to the plane of the document portion in the aperture area

(e) a camera mirror mounted to the base structure on one side of and at an acute angle to the document plane in the aperture area and at an acute angle to the combining mirror, and

(f) each of the mirrors having a reflective surface, whereby a folded optical path lying substantially in one plane is formed from a point on the document in the aperture area to the film via the camera mirror, combining mirror, back to the camera mirror and through the lens.

4,190,354

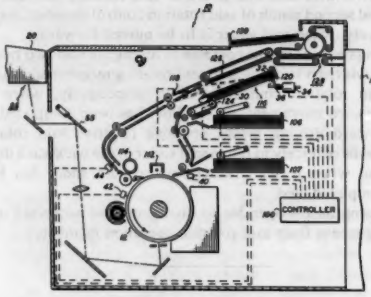
COPIER JOB RECOVERY SYSTEM

Craig A. Smith, Pittsford, and Joachim Guenther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1978, Ser. No. 956,127

Int. Cl.[2] G03G *15/00*; B65H *5/22, 31/08*

U.S. Cl. 355—3 SH **10 Claims**



1. In a copier adapted for pre-collation duplex copying, in which copy sheets are simplexed and normally fed to a first side of a duplex buffer set stacking means in collated serial page order, where said copy sheets are normally stacked relative to a main supporting surface means and then fed out from the second and opposite side of said buffer set stacking means in serial page order by a first sheet feeding means to be duplexed; a job recovery system for replacing lost copy sheets and continuing pre-collation duplex copying run, comprising:

means for making up one or more replacement simplexed copy sheets in response to the sensing of lost copy sheets during a duplex copying run;

shifting means for temporarily shifting the position of a buffer set stack of copy sheets in said buffer set stacking means relative to said main supporting surface means to provide a space therebetween into which said replacement simplexed copy sheets can be fed at said second side of said buffer set stacking means;

second sheet feeding means adjacent said buffer set stacking means for feeding said replacement simplexed copy sheets into said space;

said shifting means being further adapted to shift said buffer set stack back to its normal position after said replacement copy sheets have been fed into said space;

said second sheet feeding means and said shifting means being adapted to position said replacement simplexed copy sheets in a position to be fed out from said buffer set stacking means by said first sheet feeding means before other sheets in said buffer set stack so as to maintain a precollated buffer set stack in collated serial page order for continued copying.

4,190,355

FACETTED REFLECTOR

Stephen T. Avery, Rochester; John A. Durbin; William L. Lama, both of Webster, and Paul H. Stiebitz, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1978, Ser. No. 902,305

Int. Cl.[2] G03B *27/76*

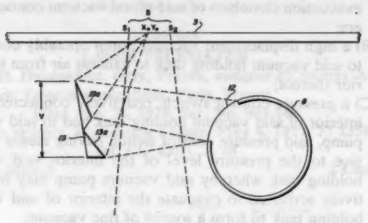
U.S. Cl. 355—71 **6 Claims**

1. In a photocopier, a scanning illumination system for incrementally illuminating a scan strip on an object surface, including

a linear light source disposed adjacent to and on one side of said scan strip said light source having an aperture defined through a portion thereof through which light is directed to said scan strip,

a reflector located on the opposite side of said scan strip with its reflective surface facing said light source aperture so as to reflect illumination from said light source towards said scan strip,

said reflector comprising a plurality of plane mirror facets, each facet having an individual surface length and disposed at



an individual angle to a plane normal to said object surface such that every point on each facet surface reflects light received from said illumination source onto an instantaneous scan line within said scan strip, and

means to effect relative scan travel of said object surface and said illumination system.

4,190,356

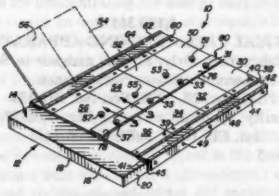
PHOTOGRAPHIC EASEL APPARATUS

Paul A. Knapp, 1303 W. 9th St., Tempe, Ariz. 85282

Filed Jun. 1, 1978, Ser. No. 911,381

Int. Cl.[2] G03B *27/58, 27/44*

U.S. Cl. 355—74 **13 Claims**



1. Photographic easel apparatus for holding photographic paper, comprising, in combination:

base means, including

a planar top, including a first portion for holding photographic paper and a second portion adjacent the first portion comprising a focusing plane,

a first side and a second side adjacent the top,

panel means, including a plurality of panels on the first portion of the top individually movable from a closed position covering photographic paper disposed on the first portion of the top to an open position exposing the photographic paper disposed on the first portion of the top; and

means for aligning the photographic paper on the first portion of the top of the base means.

4,190,357

PHOTOGRAPHIC ENLARGING EASEL

Edward Kostiner, 218 Oakridge Dr., Baie d'Urfe, Quebec, Canada (H9X 2N4)

Filed Oct. 20, 1978, Ser. No. 953,074

Int. Cl.[2] G03B *27/58*

U.S. Cl. 355—74 **12 Claims**

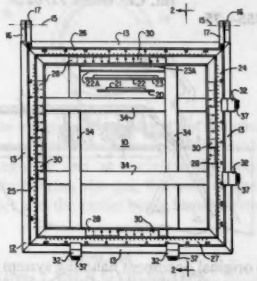
1. A photographic enlarging easel for positioning and masking a sheet of photographic paper comprising,

base plate having a flat surface for the sheet of paper,

rectangular open frame formed of four members, each having substantially similar cross sections, the frame pivoted about a pivot line parallel to and extending outside one edge of the base plate, the frame when in a closed position resting on the flat surface of the base plate allowing the sheet to extend beyond the base plate,

paper positioning means for locating the paper on the base plate,

plurality of removable carriages each carriage having a masking blade with a first end rigidly attached thereto, each carriage adapted to slide on a carriage track formed



integral with each member and extending from side to side of the frame, a second end of the masking blade adapted to slide in a guide slot on an opposite member of the frame, the masking blade resting on the flat surface of the base plate when the frame is in the closed position, each carriage having a locking means to lock the carriage to the member at any position on the track,

the frame having at least two sliding scales in each of two places adapted to measure border widths on four sides of the sheet in any location in the frame.

4,190,358

APPARATUS FOR POSITIONING AN ORIGINAL IN REPRODUCING MACHINES

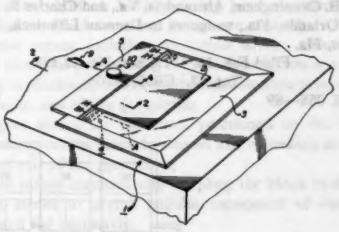
Kazuyasu Sasuga, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,164

Claims priority, application Japan, Feb. 25, 1977, 52-19141

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **2 Claims**



1. In a xerographic reproducing apparatus having a platen forming a part of a housing for supporting a document to be copied and an optical projection system for projecting light images of said document from said platen to a photosensitive member and a movable registration edge for properly aligning said document, the improvement comprising:

means for effecting incremental movement of said registration edge between first and second operative positions relative to said platen; said means for effecting incremental movement of said registration edge comprising a rack operatively coupled to said registration edge and pinion

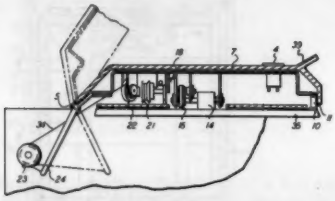
means operatively coupled to an actuatable wheel, said wheel protruding through said housing for manipulation thereof.

4,190,359

COPIER DOCUMENT HANDLING SYSTEM

Yuichi Murayama, and Terumasa Sugiyama, both of Ebina, Japan, assignors to Rank Xerox Limited, London, England

Filed Dec. 21, 1978, Ser. No. 972,162
Claims priority, application Japan, Mar. 8, 1978, 53/28462[U]
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **5 Claims**



1. In an original document handling system for a copier with a platen cover mountable over the copying platen of a copier, which platen cover is movable toward and away from the platen, said document handling system being adapted to automatically feed a document off of the platen after it has been copied by document drive means in said platen cover, the improvement comprising:

energy storage means connecting between said copier and said platen cover to mechanically capture and store mechanical energy obtained from said movement of said platen cover toward and away from said platen,

said energy storage means including overload protection means for limiting the maximum mechanical energy storage therein, and

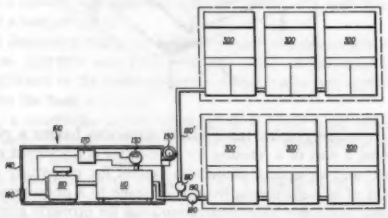
logic control means controlling electromechanical interconnecting means for operatively connecting said energy storage means to said document drive means to drive said document drive means for a limited period after the completion of copying of the document on said platen from said mechanical energy stored in said energy storage means obtained from said movement of said platen cover.

4,190,360

VACUUM CONTACT REPRODUCTION APPARATUS

Bruce B. Cunningham, Alexandria, Va., and Charles R. Barfield, Jr., Orlando, Fla., assignors to Lanman Lithotech, Inc., Orlando, Fla.

Filed Feb. 16, 1979, Ser. No. 13,190
Int. Cl.[2] G03B *27/04*
U.S. Cl. 355—89 **5 Claims**



1. In contact reproduction wherein a master transparency is duplicated onto a photosensitive material, apparatus in combination with plural vacuum contact printers, each having an evacuation chamber formed by a surface, for supporting the master transparency and photosensitive material, and a transparent cover coactively connected to said support surface to afford access into said chamber, and having a source of exposing radiation directed toward said transparent cover, said apparatus comprising:

(A) a vacuum holding tank, the interior of which defines an exhaustible reservoir, the volume of said reservoir being significantly greater than the combined volumes of the evacuation chambers of said plural vacuum contact printers;

(B) a high displacement vacuum pump operably connected to said vacuum holding tank to exhaust air from the interior thereof;

(C) a pressure control switch, coactively connected to the interior of said vacuum holding tank and to said vacuum pump, said pressure control switch having means responsive to the pressure level of the interior said vacuum holding tank whereby said vacuum pump may be selectively activated to evacuate the interior of said vacuum holding tank to form a source of fine vacuum;

(D) vacuum coupling means, operably connected to the respective evacuation chambers of each of said plural vacuum contact printers and to said source of fine vacuum, for selectively connecting said evacuation chambers to said source of fine vacuum to form a temporary fine vacuum in said evacuation chambers whereby said master transparency and photosensitive material are rapidly drawn into intimate contact;

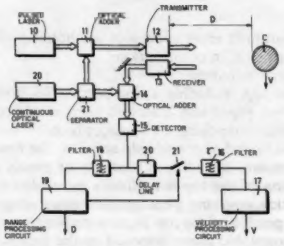
(E) exposure control means operably connected to the respective sources of exposing radiation of each of said plural vacuum contact printers for selectively activating said sources of exposing radiation while said master transparency and photosensitive material are drawn into intimate contact.

4,190,361

OPTICAL TELEMETERING APPARATUS

Gerard H. Dubrunfaut, Orly, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Apr. 28, 1978, Ser. No. 901,139
Claims priority, application France, May 4, 1977, 77 13589
Int. Cl.[2] G01C *3/08*; G01P *3/36*
U.S. Cl. 356—5 **4 Claims**



1. An optical telemeter with heterodyne detection of the type comprising a pulsed laser, an optical system at transmission for concentrating the energy supplied by the laser on a remote target, an optical system at reception for collecting part of the energy reflected by the target, a local oscillator for supplying a continuous light wave at a frequency near the operating frequency of the pulsed laser, first optical adder means for adding the reflected radiation from the reception optical system and the radiation supplied by the local oscillator, a photodetector receiving the radiation from said first optical adder means and supplying an electric output signal at the beat frequency, and a processing circuit for deriving the distance between the target and the apparatus from the output signal of the photodetector, second optical adder means mounted between the pulsed laser and the transmission optical

system, a separator for diverting part of the radiation produced by the local oscillator and directing it towards said second optical adder means thereby to direct on said target a composite optical signal having a pulsed component and a continuous component, and a second processing circuit for deriving the velocity of the target from the output signal of the photodetector.

4,190,362

LASER TELEMETER

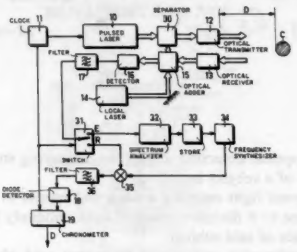
Gérard H. Dubrunfaut, Orly, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Apr. 28, 1978, Ser. No. 901,140

Claims priority, application France, May 4, 1977, 77 13588

Int. Cl.[2] G01C *3/08*

U.S. Cl. 356—5 **2 Claims**



1. An optical telemeter with heterodyne detection, comprising a pulsed laser controlled by a clock, an optical system at transmission for concentrating the energy supplied by the laser on a remote target, an optical system at reception for collecting part of the energy reflected by the target, a local oscillator for supplying a continuous light wave at a frequency near the transmission frequency of the pulsed laser, an optical adder for adding the reflected radiation from the reception optical system and the radiation supplied by the local oscillator, a photodetector receiving the radiation from said optical adder and supplying at its output an electric signal at the beat frequency, called reflection beat signal, and a chronometer connected to the clock and to the photodetector for measuring the time lapsed between the instant of transmission and the moment when the reflected signal is received, further comprising a separator for diverting part of the energy being transmitted by the pulsed laser onto said target and directing it towards said optical adder, means connected to said detector for storing, before the return of the reflected radiation, the transmission beat signal thus obtained, means for beating the transmission beat signal and the reflection beat signal, the resulting signal being applied to the chronometer, switch means receiving the output of the photodetector and having one output connected to said storing means and the other connected to said beating means, and having a drive input connected to said clock thereby to connect the detector to said storing means solely during the transmission of a pulse by said pulsed laser.

4,190,363

DEVICE FOR MEASURING CONCENTRATION OF A GAS

Werner Adrian, Im Roth 19, Ettlingen-Oberweier, Fed. Rep. of Germany (7505)

Filed Jun. 10, 1977, Ser. No. 805,334

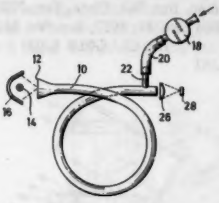
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 2626642

Int. Cl.[2] G01N *21/22*

U.S. Cl. 356—246 **12 Claims**

1. In a device for measuring the concentration of a gas of the type in which a sample of the gas to be measured is introduced into a chamber through which radiation is passed from a source to a detector, and in which the radiation is selectively absorbed by the gas, the improvement wherein:

the chamber is formed from a curved tube, through which the radiation can pass from one end to the other, the interior surface of the tube being highly reflective of



radiation at the absorption wavelength of the gas, the tube having an inlet adjacent one of its ends for introducing the gas to be measured and an outlet at the opposite end thereof for discharging the gas, the wall of the tube between the inlet and the outlet being imperforate.

4,190,364

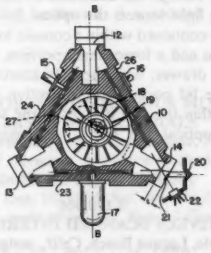
RING LASER GYROSCOPE

Bo H. G. Ljung, Wayne, N.J., and George R. Gamertsfelder, Pleasantville, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Sep. 7, 1977, Ser. No. 831,114

Int. Cl.[2] G01B *9/02*; G01P *9/00*

U.S. Cl. 356—350 **5 Claims**



1. A ring laser gyroscope including:

a symmetrical block having a ring laser resonant cavity therein in which two laser beams are created;

reflective means, including an output mirror, mounted on said block for propagating the two laser beams in a closed loop in clockwise and counterclockwise directions around an input axis of the gyroscope;

a support means for the block positioned on the line of symmetry of the block having an axis extending along the input axis of the gyroscope;

resilient means mechanically coupling the block to the support means to permit angular movement of the block around the input axis;

a photodetector;

comepnsating interferometer means for causing the output from the gyroscope to be free from the influence of mechanical vibrations introduced to the block about the input axis over a substantial angular displacement of the block, comprising a stationary retro-reflector, an optical wedge attached to the outer surface of the output mirror, and a prism attached to the outer surface of said wedge for directing one of the laser beams to the retro-reflector and for directing the other laser beam and a reflected beam from the retro-reflector to the photodetector, the laser beam directed to the retro-reflector and the reflected laser

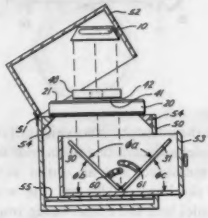
beam from the retro-reflector travelling along two parallel paths displaced from one another.

4,190,365

OPTICAL TESTING OF SURFACE FLATNESS

Calvin J. Hartman, Box 763, Clute, Tex. 77531

Filed Oct. 31, 1977, Ser. No. 847,244
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—352 10 Claims



1. An apparatus useful for determining flatness of a surface, said apparatus comprising in operable combination,

a monochromatic light source disposed to project light downwardly,

an optical flat positioned in a substantially horizontal manner, having an optically flat surface facing upwardly toward said light source, and

a reflective means positioned below the said optical flat to provide a view of the underside of the optical flat,

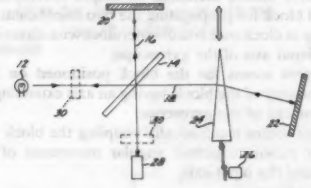
wherein the light source, the optical flat and the reflective means are contained within a console having an adjustable lid portion and a lower main portion, the lower portion housing a drawer, with the light source being positioned within the lid portion, the reflective means being positioned within the said drawer in the said lower portion, and the optical flat being positioned above the said drawer.

4,190,366

REFRACTIVELY SCANNED INTERFEROMETER

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,457
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—346 15 Claims



1. A scanning spectral analysis interferometer, of the type wherein an interference pattern is generated by comparing light components traveling along, respectively, a first fixed-length path and a second variable-length path, comprising:

a first stationary reflector determining the length of the first path;

a second stationary reflector at the end of the second path;

a single wedge-shaped prism intersecting the second path; and

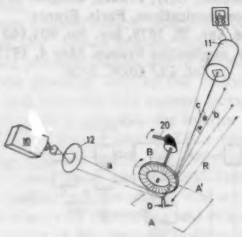
means for moving the prism across the second path to cause path length scanning.

4,190,367

DEVICE FOR ESTABLISHING A CONDITION AT THE SURFACE OF A SUBJECT

Sverker Hård af Segerstad, Långåsliden 28, Göteborg, Sweden (41270), and Olle Nilsson, Dr. Forseliusgata 50, Göteborg, Sweden (41326)

Filed Nov. 16, 1977, Ser. No. 852,154
Claims priority, application Sweden, Dec. 7, 1976, 7613703
Int. Cl.[2] C01B 9/02; G01N 21/48; G01B 11/30
U.S. Cl. 356—354 10 Claims



1. An optical detection device for measuring smoothness at a surface of a subject including

a coherent light emitting source and means to mount said source so it directs a beam of light obliquely towards the surface of said subject,

a photodetector and means to mount said photodetector outside the path of a main beam being mirror-image reflected from said surface but so it catches a secondary beam of scattered light reflected from an irregularity at said surface,

a diffraction grating and means to mount said grating in the path of said main reflected beam, so a further beam, deflected from said main reflected beam will coincide said secondary beam within said photodetector,

means for causing a relative movement between said grating and said subject, and

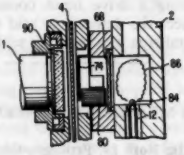
further means for measuring the frequency and the amplitude of the time dependent photocurrent determined by the interaction of said reflected, secondary beam and said deflected beam within the photodetector.

4,190,368

SULFUR MONITOR ANALYZER

Edward Etess, San Diego, Calif., assignor to Monitor Labs, Inc., San Diego, Calif.

Filed Jun. 19, 1978, Ser. No. 916,911
Int. Cl.[2] G01J 3/50; G01N 21/58
U.S. Cl. 356—417 11 Claims



1. A system for detecting sulfur concentrations in a gas mixture sample which comprises:

a flame holder;

a flame chamber within which said flame holder is disposed;

means for continuously obtaining and transferring a portion of the sample to said flame holder;

means for continuously transferring hydrogen to said flame

chamber, thus generating a flame and causing chemiluminescent radiation;

means for detecting light from said chemiluminescent radiation for measuring signals indicative of concentrations in the sample; and

optical shutter means disposed between flame chamber and said light detecting means for alternately exposing and obscuring the chemiluminescent radiation emitted from said flame chamber while continually exposing the flame to said light detecting means.

4,190,369

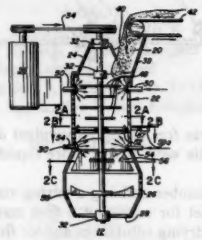
METHOD AND APPARATUS FOR MAKING MOLDS

Leslie D. Rikker, Oak Forest, Ill., assignor to National Engineering Company, Chicago, Ill.

Division of Ser. No. 731,930, Oct. 13, 1976, Pat. No. 4,121,646. This application Jul. 14, 1978, Ser. No. 924,620

Int. Cl.² B28C *5/16, 7/06*

U.S. Cl. 366—16 **16 Claims**



1. A mixing device for dispensing a mixture of molding sand and a resin binder system onto a mold forming pattern comprising:

a mixing chamber having an inlet for receiving sand adjacent an upper level and a discharge outlet for said mixture adjacent a lower end,

a rotor mounted in said chamber including an upstanding rotating shaft extending between said inlet and said outlet and a plurality of radially extending mixing elements carried for rotation with said shaft,

means for injecting binder into said chamber between said inlet and outlet for intimate mixing with said sand moved around said shaft by said mixing elements,

said injecting means including a first conduit for injecting a first component of a resin binding system adjacent a first portion of said chamber and a second conduit for injecting a second component of a resin binder system intermediate the level of said first injecting conduit and said outlet of said chamber, and

adjustable flow control means between said first and second conduits dividing said chamber into first and second sections for controlling the flow of intermixed sand and said first component therebetween.

4,190,370

ASPHALT PLANT WITH IMPROVED TEMPERATURE CONTROL SYSTEM

James D. Brock, and Erbie G. Mize, both of Chattanooga, Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Nov. 24, 1978, Ser. No. 963,445

Int. Cl.² B28C *5/46*

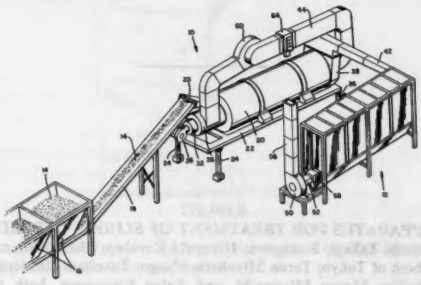
U.S. Cl. 366—25 **19 Claims**

1. In an apparatus for producing asphalt-aggregate material including means for mixing asphaltic raw materials in a mixing enclosure, means for continuously admitting asphaltic raw materials into said mixing enclosure, means for continuously withdrawing asphalt-aggregate material from said mixing enclosure, a variable heat source for providing high temperature gases, and means for admitting said high temperature gases into said mixing enclosure, the improvement comprising:

means for diluting said high temperature gases with dilution gases prior to admittance of said gases to said mixing enclosure;

means for withdrawing said high temperature and dilution gases from said mixing enclosure;

means for sensing the temperature of said asphalt-aggregate material as it is being withdrawn from said mixing enclosure; and



means, responsive to variations in the temperature of said asphalt-aggregate material as said material is being withdrawn, for varying the rate of flow of said high temperature and dilution gases through said mixing enclosure to maintain said material as it is withdrawn at a first predetermined temperature while maintaining the temperature of said high temperature and dilution gases being admitted into said mixing enclosure at a second predetermined temperature.

4,190,371

APPARATUS FOR DISCONTINUOUS MIXING OF AT LEAST TWO MATERIALS

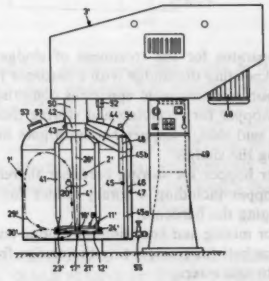
Herbert Dürr, Viernheim, and Helmut Müller, Mannheim, both of Fed. Rep. of Germany, assignors to Draiswerke GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,045

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757486

Int. Cl.² B01F *7/16, 13/06*

U.S. Cl. 366—139 **6 Claims**



1. An apparatus for discontinuous mixing of at least two substances, of which at least one is a liquid, the apparatus comprising a container, a mixer disposed in the container, said mixer having a first rotor driveable at high speed through a first shaft a second rotor, and respective teeth disposed on said first rotor and said second rotor in mutually concentric circles for movement past one another to form shearing slots, and at least a circle of teeth located farther outward radially on said

first rotor being disposed radially outside a circle of teeth on said second rotor, wherein the apparatus is provided with a secondary drive shaft for imparting rotation of said second rotor at a rotational speed substantially lower than the contemporaneous speed of rotation of said first rotor, and wherein said secondary drive shaft carries a scraper positioned in the vicinity of the interior wall of said container.

4,190,372

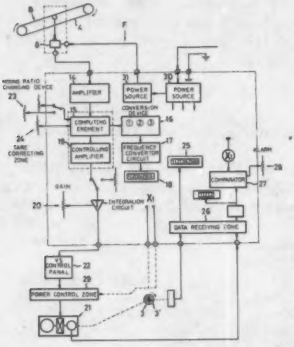
APPARATUS FOR TREATMENT OF SLUDGE DEPOSIT

Atsushi Takagi, Kanagawa; Hiroyuki Kuroiwa; Mitsuo Miura, both of Tokyo; Teruo Mizuhata, Hyogo; Takefumi Ito, Hokkaido; Masao Miyaguchi, and Tateo Kawamura, both of Tokyo, all of Japan, assignors to Takenaka Komuten Co., Inc., Osaka, Japan

Filed Dec. 30, 1976, Ser. No. 755,458

Int. Cl.[2] B01F *3/14, 15/02*

U.S. Cl. 366—141 **6 Claims**



1. An apparatus for the treatment of sludge deposits by mixing and kneading the sludge with a hardener to solidify the sludge deposit, said treatment apparatus comprising:

a sludge hopper for receiving and storing therein dredged sludge, said sludge hopper having a gate means for discharging the sludge;

a hardener hopper for storing hardener therein, said hardener hopper including a rotary feeder for controllably discharging the hardener;

a mixer for mixing and kneading the sludge and hardener;

a conveyor belt for transporting the sludge from said gate means to said mixer;

a conveyor scale connected to said conveyor belt for measuring the amount of sludge on said conveyor, said scale including a load cell and a meter for measuring the speed of said belt; and

an electric control device for controlling said rotary feeder in response to output signals from said scale;

whereby the ratio between the amount of sludge and the amount of hardener fed to the mixer is maintained at a prescribed level.

4,190,373

METHOD AND APPARATUS FOR MIXING PULVERULENT DRYING SUBSTANCES AND/OR FLUENT MEDIA WITH ONE OR MORE LIQUIDS

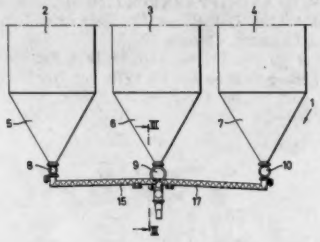
Friedrich J. Zucker, Neuss, and Hans J. Langenbusch, Giessen, both of Fed. Rep. of Germany, assignors to Supraton F. J. Zucker KG, Neuss, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,162

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705535

Int. Cl.[2] B01F *7/00*

U.S. Cl. 366—160 **19 Claims**



11. An apparatus for mixing pulverulent drying substances and/or fluid media with one or more liquids, said apparatus comprising:

(a) a mixing chamber defining a mixing zone and having at least one inlet for receiving a first material comprising pulverulent drying substances and/or fluid media,

(b) nozzle means for introducing liquid into said mixing zone at the mixing chamber simultaneously with said first material at a pressure sufficient to form a finished resultant mixture within the mixing zone, and

(c) outlet means for continuously discharging said resultant mixture from the mixing zone.

4,190,374

LOOSE-LEAF BINDER

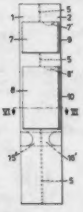
Stig E. V. Lindell, Sagagatan 13, S-171 47 Solna, Sweden

Continuation of Ser. No. 765,590, Feb. 4, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,795

Claims priority, application Sweden, Feb. 23, 1976, 7602082

Int. Cl.[2] B42F *3/00*

U.S. Cl. 402—3 **7 Claims**



1. A binder comprising, in combination, a pair of covers, a spine interconnecting said covers for pivotal movement of said covers between an open and a closed position, said spine including a pair of spaced apart longitudinally extending half-sections having outer side edges connected to said covers, said half-sections being connected by a flexible member secured to said half sections defining a hinge, one of said half-sections being provided with label holder means comprising at least one substantially rigid flap member secured thereto extending over a portion of the length of said one half-section with one end of

said flap extending substantially traverse from a portion of said one half-section to provide a plate-like projection; means on said projection to positively retain a label, said other half-section defining a recess opening into which the projection can extend and be seated when the covers of the binder are closed precluding the label holder means from being subjected to bending stresses during the process of opening and closing the binder, a latching device for selectively holding said half-sections together in the closed position of said covers, gripping means provided on said binder allowing for the insertion of fingers in said binder and means on said half-sections for holding hole-punched papers and the like.

4,190,375

FASTENING DEVICE

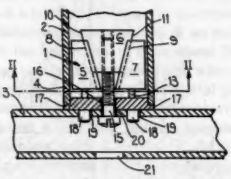
George A. Berry, Ashwell, England, assignor to International Computers Limited, London, England

Filed Jul. 7, 1977, Ser. No. 813,518

Claims priority, application United Kingdom, Jul. 23, 1976, 30714/76

Int. Cl.² F16B *7/00*

U.S. Cl. 403—7 **6 Claims**



1. A fastening device including at least two wedge elements each having a narrow and a wide end and a sloping face extending therebetween; and a deformable connection between the elements effective to permit the elements to be disposed with said sloping faces abutting one another and to permit sliding action between the elements, the deformable connection including a base plate, a frangible peg securing the wide end of at least one of said elements to the base plate, and means for connecting the narrow end of the other element to the base plate and for moving said other element towards the base plate to produce the sliding action between the elements.

4,190,376

FASTENING DEVICE FOR A SAFETY FENCE BEAM

Hans Urlberger, Gutwerkstrasse 45, 8750 Aschaffenburg, Fed. Rep. of Germany

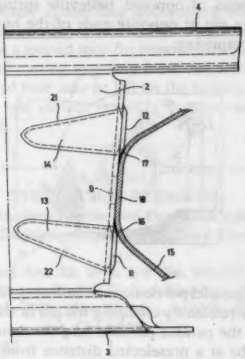
Filed May 5, 1978, Ser. No. 903,070

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720414

Int. Cl.² E01B *5/18*

U.S. Cl. 403—14 **6 Claims**

1. In a fastening device for attaching a safety fence beam to a post wherein the fastening device is positioned intermediate the beam and post and includes transverse surfaces respectively attachable to the beam and post, the improvement comprising at least one corrugation in the surface attachable to said



beam, said corrugation having a raised edge in aligning and supporting relation to said beam.

4,190,377

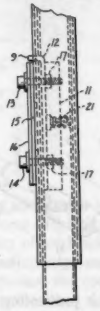
ADJUSTABLE COLUMN

Mark E. Pleuss, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 1, 1978, Ser. No. 882,077

Int. Cl.² F16B *7/14*

U.S. Cl. 403—108 **15 Claims**



1. An adjustable column including a pair of telescopically coupled longitudinal members with a laterally movable latch on one member that selectively engages spaced supports on the other member to adjust the column's length, wherein the improvement comprises: a manually tightenable lock supported on the latch, which lock secures the members together in a direction approximately parallel to the latch's movement.

4,190,378

ARTICULATED JOINT INCLUDING BELLEVILLE SPRING SEALS MAINTAINED IN PRESELECTED COMPRESSED STATE

Gary L. Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

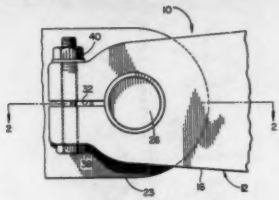
Filed Mar. 15, 1979, Ser. No. 20,695

Int. Cl.² F16C *11/00*; F16D *1/12*

U.S. Cl. 403—146 **1 Claim**

1. In an articulated connection between first and second members, the first member including a pair of parallel portions disposed on opposite sides of and pivotally interconnected to

the second member by a pivot pin assembly including aligned holes in the pair of parallel portions and the second member, a bushing received in the hole of the second member and first and second pairs of opposed Belleville springs respectively located on the pin at opposite ends of the bushings, the improvement comprising:



said pair of parallel portions, each including releasable clamp means for releasably clamping the pin in the holes thereof whereby the parallel portions may be clamped to the pin so as to be at a preselected distance from each other to thereby effect a preselected compression of the first and second pairs of Belleville springs.

4,190,379

DEVICE FOR RESERVING INDIVIDUAL PARKING AREAS

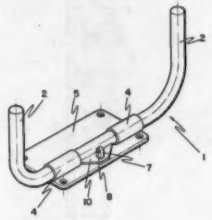
German Toro Sósa, Apolonia Morales, 21-90, and José L. Sever Ezcurra, Apolonio Morales, 21-80, both of Madrid, Spain

Filed Jun. 6, 1978, Ser. No. 912,988

Claims priority, application Spain, Nov. 16, 1977, 232.091[U]; Mar. 28, 1978, 234.966[U]

Int. Cl.[2] E01F *13/00*

U.S. Cl. 404—6 **8 Claims**



1. A barrier device for preventing unauthorized use of a parking area and for preventing unauthorized removal of a vehicle lawfully occupying the parking area, said barrier device comprising:

a generally U-shaped rigid barrier element including a horizontal member having extending from opposite ends thereof two parallel leg members;

a flat plate including means for rigidly fixing said plate to a floor adjacent an entrance to a parking area;

said flat plate including bearing means for rotatively supporting said barrier element;

said barrier element being fixed to said flat plate with said horizontal member rotatively supported by said bearing means for rotation in opposite directions about the axis of said horizontal member between an inoperative position, whereat said leg members extend substantially parallel to said flat plate and the floor of the parking space, and an operative position, whereat said leg members extend substantially vertically to said flat plate and the floor of the parking space;

stop means on said barrier element for cooperative abutment with said flat plate for limiting the extent of rotation of said barrier element with respect to said flat plate in at least one of said opposite directions and for thereby defining said operative position;

locking means cooperable with said stop means and with said flat plate for preventing rotation of said barrier element from said operative position to said inoperative position;

said horizontal member having a length sufficient to allow a vehicle to pass over said barrier element when said barrier element is in said inoperative position; and

said leg members having a length such that, when said barrier element is in said operative position, the upper ends of said leg members reach a height which is below the level of a bumper of a vehicle but which is sufficient to contact the undercarriage or lower parts of the vehicle, thereby presenting a barrier to the movement of the vehicle into or from the parking area.

4,190,380

DEVICE IN CONCRETE BLOCKS

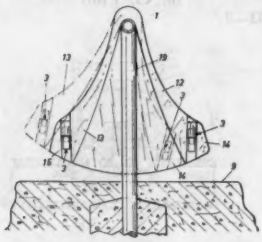
Bengt Ö. Almér, Saltholmsgatan 5, Vastra Frolunda, Sweden (S-421 76), and Karl G. Gidlöf, Sjögången 28, Västra Frolunda, Sweden (S-421 71)

Filed Dec. 8, 1978, Ser. No. 967,689

Claims priority, application Sweden, Dec. 12, 1977, 7714053; Oct. 27, 1978, 7811174

Int. Cl.[2] E01F *15/00*

U.S. Cl. 404—6 **14 Claims**



1. An improvement in concrete blocks of the kind intended to be interconnected in end-to-end positions to form barriers for delimitation of roadways, parking lots and similar enclosed areas, said blocks having an essentially triangular cross-section configuration and an elongate shape, the improvement comprising

a coupling element positioned at each end of said block, said element consisting of an essentially T-shaped metal piece cast into said block, the cross-bar of said T-shaped metal piece extending in parallel with the end face of said concrete block, said cross-bar arranged, jointly with a similar cross-bar of a coupling element positioned in the end face of the adjoining concrete block, to be enclosed by a tube, thus locking together said two blocks positioned end-to-end.

4,190,381

WAVE-COMPLIANT, BOTTOM TENSION BOOM

Ernest Knaus, Akron; Dale C. Goubeaux, Tallmadge; Anthony L. Dunne, Hudson, all of Ohio; George A. Lucas, Rockmart, Ga., and Jere A. Noerager, Houston, Tex., assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 8, 1978, Ser. No. 932,051

Int. Cl.[2] E02B *15/04*

U.S. Cl. 405—72 **18 Claims**

1. A bottom tension boom for wave compliance, comprising:

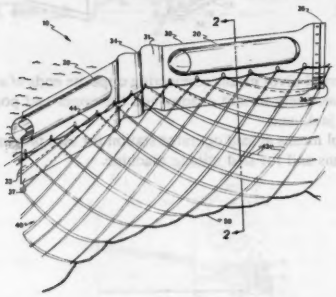
a plurality of flotation elements residing upon a body of water;

a contaminate impervious barrier, said barrier having an upper freeboard portion and a lower skirt portion, said flotation elements attached to said freeboard portion and causing said

flotation elements and said freeboard portion to largely reside upon the surface of said water, said skirt portion largely submerged in and extending downwardly into said body of water;

a lattice, said lattice containing a plurality of extensible strands, said strands attached to said skirt and extending downwardly therefrom and having a bottom portion;

a single tension line means for carrying the entire load on said boom, said single tension line means being a bottom tension line, said bottom tension line attached to said bottom portion of said lattice,



said lattice strands attached to said skirt and said bottom tension line in such a manner to form a criss-crossed lattice, said criss-crossed lattice strands attached at an inclination angle with respect to the horizontal of from about 10° to about 40° to said skirt and said bottom tension line when said skirt and said bottom tension line are in a horizontal position so that wave compliance of said flotation elements with said body of water is achieved while said bottom tension line remains relatively motionless, and

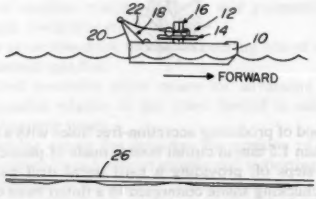
said barrier being longer than the corresponding length of said attached bottom tension line, said barrier having slack portions therein, said slack portions located between adjacent flotation elements.

4,190,382

SEPARABLE TRENCHING APPARATUS

Thomas R. Schmitz, League City; Avadhesh N. L. Srivastav, Houston; Joe C. Lochridge, Houston, and William A. Morgan, Houston, all of Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Mar. 9, 1978, Ser. No. 884,987
Int. Cl.² E02F 5/02
U.S. Cl. 405—159 **39 Claims**



1. Apparatus for entrenching an elongated pipeline and the like on the bottom of a body of water comprising

a burying sled base, including

first and second pontoon skids having generally parallel longitudinal axes, said pontoon skids being connected by a cross support means to straddle said pipeline,

a trench cutting assembly adapted to be connected to said sled base for cutting a trench beneath said pipeline, when said pipeline lies on said water bottom, and

remote connecting and disconnecting means operative in a first state for remotely connecting said cutting assembly in an operational relationship to said sled base for entrenching said pipeline and in a second state for remotely disconnecting and separating said cutting assembly from said sled base,

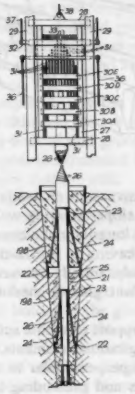
whereby said sled base may be left on the bottom of said body of water and said cutting assembly may be raised aboard a floating vessel.

4,190,383

STRUCTURAL ELEMENT

John F. S. Pryke, Broxbourne, and David S. Pryke, Brent Pelham, both of England, assignors to Pynford Limited, London, England

Filed Jan. 11, 1978, Ser. No. 868,529
Claims priority, application United Kingdom, Jan. 13, 1977, 1354/77; Jan. 24, 1977, 2711/77; Mar. 9, 1977, 9866/77
Int. Cl.² E02D 5/10
U.S. Cl. 405—252 **12 Claims**



1. A method of driving a columnar load-bearing pile into the ground, said pile comprising a leading segment for penetrating the ground and a plurality of load-bearing segments, the leading segment having a leading edge and a trailing edge with a body extending therebetween, the cross-sectional area of the leading segment being smaller than the cross-sectional area of each load-bearing segment, each load-bearing segment having a leading edge, a trailing edge and a body extending therebetween, said method comprising the steps of:

(a) forcing the leading segment into the ground so that its entire axial length is tightly engaged therewith,

(b) forcing the leading edge of the first load-bearing segments into the ground until it abuts against the trailing edge of the leading segment,

(c) advancing the leading segment further into the ground an axial distance corresponding to a small fraction of its length to form a gap between the leading segment and the first load-bearing segment,

(d) advancing the first load-bearing segment further into the ground until the gap is closed and the leading edge of the first load-bearing segment abuts against the trailing edge of the leading segment,

(e) repeating steps (c) and (d) several times, and in the stated sequence, until the leading segment and the first load-bearing segment have been forced completely into the ground in tight frictional engagement along their axial lengths,

(f) forcing the leading edge of the second load-bearing segment into the ground until it abuts against the trailing edge of the first load-bearing segment, and

(g) repeating steps (c), (d) and (f) several times, and in the stated sequence, so that gaps between the adjacent segments are alternately formed and closed until the leading segment and the plurality of load-bearing segments have all been forced completely into the ground in tight frictional engagement along their axial lengths.

4,190,384

CONCRETE CONSTRUCTION ELEMENT SYSTEM FOR ERECTING PLANT ACCOMMODATING WALLS

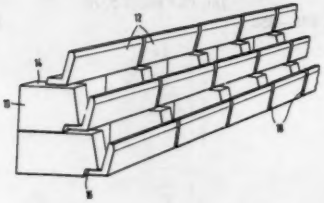
Herwig Neumann, Herrenberger Str. 39, 7031 Hildrizhausen, Fed. Rep. of Germany

Continuation of Ser. No. 682,014, Apr. 30, 1976, abandoned. This application Aug. 9, 1978, Ser. No. 932,449

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519232

Int. Cl.[2] E02D *5/20*; A01G *9/12*

U.S. Cl. 405—284 **14 Claims**



1. A system of construction elements for the erection of plant accommodating, slope-retaining walls comprising:

a plurality of L-shaped longitudinal elements arranged in multilevel relationship having a horizontally extending base plate portion and a substantially upwardly extending railing portion providing plant growth medium support surfaces, and

a plurality of section support elements acting as vertical partitions along said longitudinal elements, extending horizontally in the direction perpendicular to the direction of said longitudinal elements and protruding into the slope to be retained and having upper and lower seating surfaces adapted to be stacked one upon the other

wherein the shearing forces of the earth slope along the wall are sectioned by the vertical partitions,

wherein each of said sectional support elements displays a recess in said lower seating surface for overlapping the base plate portion of a longitudinal element supported on said upper seating surface of a lower section support element and

wherein the sectioned shearing forces are additionally divided by the base plate portions of the longitudinal elements.

4,190,385

PROTECTIVE CANOPY AND TEMPORARY ROOF SUPPORT FOR MINING MACHINERY

Ray Childress, P.O. Box 853, Richlands, Va. 24641

Filed Oct. 3, 1978, Ser. No. 948,209

Int. Cl.[2] E21C *11/02*

U.S. Cl. 405—288 **9 Claims**

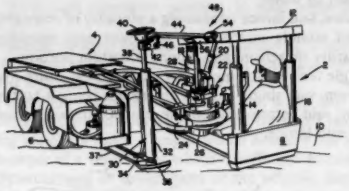
1. A temporary roof support for an ambulatory mining machine having a chasis, means for supporting the chassis for movement along the ground, means providing an operator station for said machine, a canopy over the operator station, and means for raising and lowering the canopy, the improvement which comprises:

a lengthwise extensible-retractable jack adapted to be vertically disposed away from one side of the operator station and having upper and lower end portions,

pressure fluid means for extending and retracting the jack,

mine-roof and ground-engaging means on the upper and lower portions respectively of the jack,

an arm,



horizontal pivot means connecting opposite ends of said arm respectively to said canopy and the upper end portion of the jack, and

control means at said operator station for said pressure fluid means and for said mining machine.

4,190,386

METHOD OF PRODUCING HOLES FREE OF ACCRETIONS IN CIRCUIT BOARDS MADE OF PLASTIC

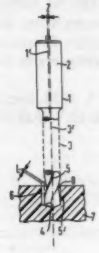
Bernhard Brabetz, and Helmut Hackl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 942,772

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742143

Int. Cl.[2] B23B *51/02*

U.S. Cl. 408—1 R **3 Claims**



1. A method of producing accretion-free holes with a diameter of less than 1.5 mm in circuit boards made of plastic, comprising the steps of: providing a hard metal drill having a cylindrical chucking shank connected to a fluted twist cutting section having a central axis, rotating said fluted twist cutting section about an axis and feeding said fluted twist cutting section along said axis relative to a circuit board, supporting the fluted twist cutting section so that its central axis rotates eccentric to said feed axis of the fluted twist cutting section by a distance sufficient to drill a hole having a diameter of at least 20 micro-meters but not more than 50 micro-meters wider than the maximum diameter of the fluted twist cutting section.

4,190,387

APPARATUS AND TOOL FOR PRECISION WORKING, PARTICULARLY SHAVING, OF GEARS

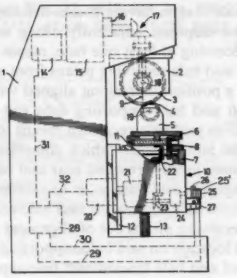
Herbert Loos, Dorfen; Manfred Heckmaier, Unterpfaffenhofen, and Gerhard Reichert, Puchheim, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Fed. Rep. of Germany

Division of Ser. No. 767,153, Feb. 9, 1977, Pat. No. 4,119,014. This application May 19, 1978, Ser. No. 907,744

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615718

Int. Cl.[2] B23F *19/06*

U.S. Cl. 409—33 2 Claims



1. Machine tool apparatus for shaving gear-shaped workpieces, comprising:

a machine frame;

first and second rotatable spindles on said frame, the axis of rotation of said first spindle being skewed relative to the axis of rotation of said second spindle;

a gear shaving tool mounted on one of said first and second spindles and a workpiece mounted on the other of said first and second spindles;

a carriage for moving said first spindle relative to said second spindle;

means for adjusting the distance between the geometric centers of the tool and the workpiece in one single selectable plane, which lies at a right angle to a common perpendicular to the axes of said first and second spindle at the smallest spacing between said geometric centers of said workpiece and said tool;

first reversible drive means for rotating one of said first and second spindles;

second reversible drive means for advancing one of said spindles relative to the other thereof in said one single selectable plane;

detecting means for detecting the position of the carriage relative to said second spindle and indicating the position through the issuance of plural signals; and

means responsive to a first one of said plural signals for controlling the speed of advancement and retraction of said first spindle relative to said second spindle and to a second one of said plural signals for controlling the direction of rotation of said first drive means to thereby control the direction of rotation of said first spindle, all as a function of the spacing between a reference position for said carriage and an actual position thereof.

4,190,388

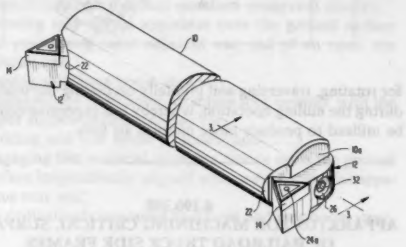
SINGLE-POINT CUTTING TOOL

George W. Mullane, and Earl K. Harrison, both of 10928 Lucerne, Houston, Tex. 77016

Filed Jun. 2, 1978, Ser. No. 911,744

Int. Cl.[2] B23B *27/16, 29/02*

U.S. Cl. 408—188 2 Claims



1. A single point cutting tool comprising:

an elongated bar having opposed ends,

at least one end including a transverse flat walled groove including a flat bottom-wall and flat sidewalls intersecting the axis of said bar,

a tip holder of complementary flat wall configuration slidably mounted within said groove with one wall in contact with the bottom-wall of said groove,

said bar being tapped and threaded axially at said one end, within said groove bottom-wall,

said tip holder being bored at right angles to its wall contacting the bottom-wall of said groove,

a cutting tip mounted to one end of said holder and projecting laterally to one side of said bar,

a securing screw carried by said tip holder, passing through said groove and being threaded to said elongated bar at its axis to lock said holder to the groove end of said bar,

and wherein said tip holder is of trapezoidal configuration in a plane parallel to said transverse groove, and the end of at least one side of said bar, at right angles to the groove axis, is beveled towards said bar end, said tip is mounted to the tip holder adjacent the sidewall which is inclined outwardly in a direction away from the face of said tip holder contacting the bottom of said groove and acts in conjunction with said beveled side of said bar so as to minimize the effect of accumulated cuttings on the operation of the cutting tool during cutting; and

whereby, the forces during cutting are not transmitted from said tip holder to said bar through said screw, eliminating strain on the screw and shear force transmission to the screw, and the ability of the bar to withstand torque during cutting is maximized by the axial location of the single screw hole.

4,190,389

PROFILE MILLING MACHINE

Jerry W. Knight, Lewisville, and Mervyn Woodward, Winston-Salem, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

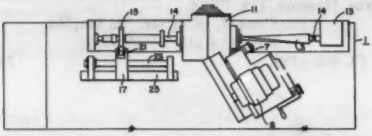
Continuation of Ser. No. 748,248, Dec. 6, 1976, abandoned. This application May 22, 1978, Ser. No. 908,045

Int. Cl.[2] B23C *1/18*

U.S. Cl. 409—120 8 Claims

1. An improved profile producing machine operable to machine a complete air foil from a workpiece utilizing a mechanism having means for rotating, traversing, and pivotally oscillating the workpiece over a milling cutter to form the air foil, the improvement comprising a plate cam disposed within said means for rotating, traversing and pivotally oscillating the workpiece to move in unison therewith and to impart the pivotally oscillating movement thereto; a cam follower dis-

posed to engage said cam follower in unison with the traversing movement of said means



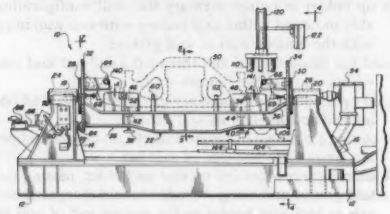
for rotating, traversing and pivotally oscillating the workpiece during the milling operation, whereby less expensive cams may be utilized to produce more uniform air foils.

4,190,390

APPARATUS FOR MACHINING CRITICAL SURFACES OF RAILROAD TRUCK SIDE FRAMES

Richard P. Yeates, Downers Grove; Boris S. Terlecky, Fox Lake, and Jagdish K. Shah, Chicago, all of Ill., assignors to Trailer Train Company, Chicago, Ill.

Filed Sep. 25, 1978, Ser. No. 945,215
Int. Cl.[2] B23C *3/00*
U.S. Cl. 409—198 **9 Claims**



1. An apparatus for machining critical wear surfaces of railroad truck side frame comprising:

a base;

a fixture rotatably mounted on the base, said fixture including leveling means for vertically leveling certain critical surfaces of the side frame on the fixture, stop means for horizontally aligning the side frame on the fixture, clamp means for clamping the side frame on the fixture, and gauge means for measuring the position of the certain critical surfaces of the side frame with respect to the fixture;

means for rotating the fixture between predetermined positions;

lock means for locking the fixture in selectable ones of said predetermined positions;

a machining head mounted on said base for movement in a first direction parallel to the axis of rotation of said fixture, for movement in a second direction horizontally and perpendicularly to the axis of rotation of said fixture; and a third direction vertically and perpendicularly to the axis of rotation of said fixture;

first stop means for controlling the limits of travel of said machining head in the first direction;

second stop means for controlling the limits of travel of said machining head in the second direction;

third stop means for controlling the limits of travel of said machining head in the third direction;

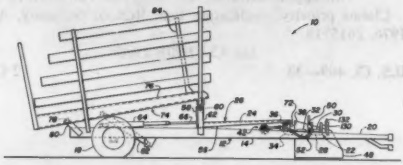
means for adjusting said first stop means in accordance with measurements of said gauge means so that said machining head is aligned with the certain critical surfaces at the limits of travel of said machining head in the first direction.

4,190,391

BALE RETAINER MEANS ON A BALE WAGON

George L. Sesser, Clovis, and Anthony E. Furtado, Geyserville, both of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Jun. 1, 1976, Ser. No. 691,677
Int. Cl.[2] B65G *21/20*
U.S. Cl. 414—39 **6 Claims**



1. In a bale wagon having means defining a bale-supporting area, means disposed adjacently along said bale-supporting area for receiving at least one bale, means for advancing said bale along said bale-receiving means from a bale-receiving end thereof to a position therealong aligned with a predetermined location on said bale-supporting area and means for moving said bale from said bale-receiving means to said bale-supporting area, the improvement which comprises:

bale retainer means arranged near said bale-receiving means for engaging said bale so as to substantially restrain said bale from moving toward said bale-receiving end of said bale-receiving means out of alignment with said predetermined location on said bale-supporting area during movement of said bale toward said bale-supporting area,

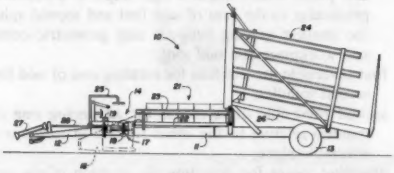
said bale retainer means including a finger element being biased toward a bale-engaging position wherein it extends into the path of advancement of said bale along said bale-receiving means so as to prevent said bale from being moved toward said bale-receiving end of said bale-receiving means, said finger element also being yieldable toward another position away from said path of bale advancement for allowing movement of said bale along said path toward said position along said bale-receiving means aligned with said location on said bale-supporting area.

4,190,392

STACK SIDE EVENER

L. Dennis Butler, Kingsburg, Calif., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 30, 1978, Ser. No. 891,972
Int. Cl.[2] A01D *87/12*; B65G *57/32*
U.S. Cl. 414—39 **7 Claims**



1. In a bale wagon having a mobile chassis, bale-receiving means mounted on said chassis, bale-accumulating means having first and second opposing sides and also mounted on said chassis, and means for transferring bales from said bale-receiving means to said bale-accumulating means, said bales being generally rectangular in shape with four flat surfaces and two opposing end surfaces, the improvement comprising:

stop means fixed to and extending along and above at least one of said first and second sides of said bale-accumulating

means to limit the movement of bales and thereby define the outer limits of said predetermined position; and

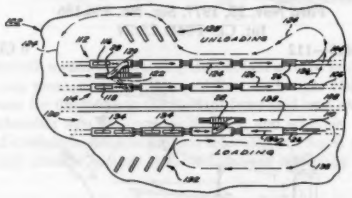
guide means fixed to said bale-accumulating means adjacent said bale-receiving means such that a bale being moved by said means for transferring will be engaged on one of its flat surfaces by said guide means and thereby directed along a path toward a predetermined position on said bale-accumulating means, said guide means comprising a series of elongate parallel spaced apart fins fixed to said bale-accumulating means and directed angularly from said bale-receiving means toward said stop means.

4,190,393

WHEELED VEHICLE CAR LOADING AND UNLOADING SYSTEM AND METHOD THEREFOR

Herbert T. Landow, North Tarrytown, N.Y., assignor to Landow Consulting Associates, Inc., North Tarrytown, N.Y.

Division of Ser. No. 559,714, Mar. 19, 1975, Pat. No. 4,076,174.
This application Feb. 22, 1978, Ser. No. 880,273
Int. Cl.[2] B61D *3/16, 47/00;* B65G *67/00;* B65J *1/10*
U.S. Cl. 414—333 **11 Claims**



1. A system for loading and unloading wheeled vehicles on a train of railroad cars, said system comprising, in combination, a first ramp at one end of said train, a side ramp device along side of and extending between said train and ground, means for forming said cars into a train-top roadway, a plurality of tractors for pulling said wheeled vehicles, and a roadway on the ground for tractors to travel between said ramps, and means for moving said side ramp device and said cars of said train relative to one another to position said side ramp device adjacent another one of said cars.

4. A method of loading and unloading trailers on a train of railroad cars, said method comprising the steps of sideloading a tractor by means of a first ramp at the side of said train, endloading a combination of said tractor and a first one of said trailers by means of a second ramp at one end of said train, moving said first ramp and said cars of said train relative to one another to position said first ramp adjacent another one of said cars, and repeating said sideloading and endloading steps for another one of said trailers.

4,190,394

METHOD FOR LOADING AND UNLOADING RAILROAD CARS

Stanley M. Herzog, and Randy L. Poggemiller, both of St. Joseph, Mo., assignors to Herzog Contracting Corporation, St. Joseph, Mo.

Filed Apr. 28, 1978, Ser. No. 901,230
Int. Cl.[2] B65G *67/00*
U.S. Cl. 414—786 **12 Claims**

1. A method of loading and unloading an open top railroad car comprising:

(a) providing a mobile powered apparatus having front and rear wheels movable over ground surface and including power actuated boom structures pivotally mounted at respective front and rear ends of said mobile apparatus wherein the front boom structure is of a length to reach below the ground surface and above the railroad car upper surface when the mobile apparatus is positioned on the ground and has a free end with a supportive foot member connected thereto and wherein the rear boom structure is articulated and of a combined length to reach the ground when said mobile apparatus is positioned on said car upper surface and said boom structure has respective arm lengths with a material engaging device pivotally mounted on a free end thereof and cooperative therewith, and a rear end of the mobile apparatus including outwardly swingable power actuated outrigger arms with respective supportive foot members connected thereto;

(b) moving said mobile apparatus over the ground surface and positioning same adjacent one end of an open top railroad car;

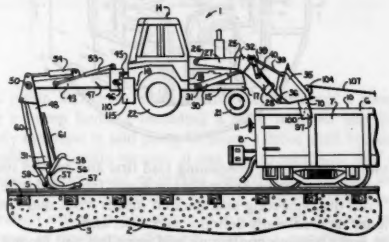
(c) raising said front boom structure

(d) engaging the front boom structure foot member with the upper surface of said railroad car;

(e) folding said rear boom structure; and

(f) engaging said material engaging device upon the ground surface longitudinally aligned with and adjacent the apparatus rear end;

(g) coordinatingly operating said front and rear boom structures and unfolding said rear boom structures in engagement with the ground surface while pressing downwardly with said front boom structure and said front supportive foot upon the railroad car upper surface to raise the mobile apparatus from the ground surface and above the upper surface of said railroad car and support said apparatus front end on the railroad car surface of said railroad front supportive foot with same;



(h) further unfolding said rear boom structure in engagement with the ground surface and moving said mobile apparatus forwardly toward said railroad car and supporting said apparatus rear end on the upper surface thereof by engaging the outrigger arms supportive foot members on the railroad car upper surface;

(i) moving said mobile apparatus along the upper surface of said railroad car; and

(j) operating said articulated rear boom structure and material engaging device to engage and disengage material relative to said railroad car and swing same to the ground surface alongside said railroad car.

4,190,395

MULTIPLE STAGE PUMP

Rowland E. Ball, Long Beach, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 28, 1978, Ser. No. 901,154
Int. Cl.[2] F01D *13/00, 25/24*
U.S. Cl. 415—61 **5 Claims**

1. A multi-stage pump comprising:

a case having a suction inlet and a discharge outlet;

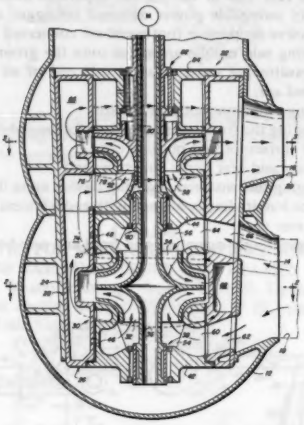
a first stage comprising multiple impellers on a first shaft;

a second stage comprising at least one impeller mounted on a second shaft;

means to rotate said shafts and the impellers mounted thereon;

said first stage being so constructed and arranged with respect to said case and said second stage to pump from said suction inlet to said second stage impeller;

said second stage being so constructed and arranged to pump from said first stage to said discharge outlet;
inlet and outlet conduit means connected respectively with said suction inlet and discharge outlet;
an inner housing fitting within said case;



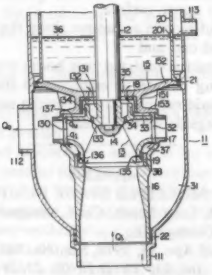
said inner housing containing said first and second impeller stages and being removable as a unit from said case without disconnecting said conduit means from said case;
inner tapered walls defining said case; and
an inner housing containing said impellers and having outer defining tapered walls complementary to the inner defining walls of said case.

4,190,396

SODIUM TURBINE PUMP

Shunzo Tomioka; Masaaki Nakano, both of Hitachi; Akira Suzuki, Tokyo, and Shizuichi Sakamoto, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1977, Ser. No. 778,089
Claims priority, application Japan, Mar. 19, 1976, 51-29215
Int. Cl.[2] F01D *11/00*
U.S. Cl. 415—110 **9 Claims**



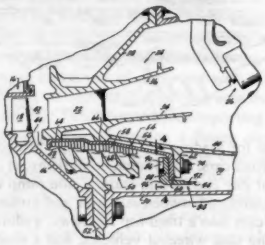
1. A turbine pump for molten sodium, having an elongated cylindrical casing, comprising:
a shaft;
an impeller including a crown ring, mouth ring and vanes arranged radially and secured to said crown ring and said mouth ring therebetween, said crown ring being secured to one end of a shaft and formed with a cylindrical impeller ring extending along said shaft in concentric relation thereto;
an impeller casing, through which said shaft extends, said impeller casing providing a given clearance to said crown ring and said impeller ring;
a suction tube positioned in the close proximity of said mouth ring and surrounding same, for introducing molten sodium from externally of said casing into said impeller;
an upper ring positioned on a surface of said impeller casing, which faces said impeller ring, with a clearance between said upper ring and the outer peripheral surface of the impeller ring, the clearance serving as a static pressure bearing with molten sodium used as a lubricant;
a lower ring positioned on a surface of said suction tube, which faces said mouth ring, with a clearance between said lower ring and the outer peripheral surface of the suction tube, the clearance serving as a static pressure bearing with molten sodium used as a lubricant.

4,190,397

WINDAGE SHIELD

Jan C. Schilling, Middletown, and James E. Gutknecht, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 23, 1977, Ser. No. 854,186
Int. Cl.[2] F01D *25/24*
U.S. Cl. 415—112 **6 Claims**



1. A windage shield for use in a fluid flowpath within a gas turbine engine to reduce fluid turbulence in a region of a first and second member and a fastener, each member having a generally radially extending flange connected together by the fastener, wherein an end of the fastener protrudes axially beyond said first member in the upstream direction, said windage shield comprising:
(a) a radially extending portion captured between the fastener and the first member;
(b) a recessed region within said radially extending portion wherein the upstream protruding end of said fastener provides a generally flush interface between the protruding end of said fastener and surrounding surfaces adjacent said upstream end; and
(c) a cylindrical section extending axially from said flange and extending downstream of said first and second members.

4,190,398

GAS TURBINE ENGINE AND MEANS FOR COOLING SAME

Robert J. Corsmeier, and James P. Rauf, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

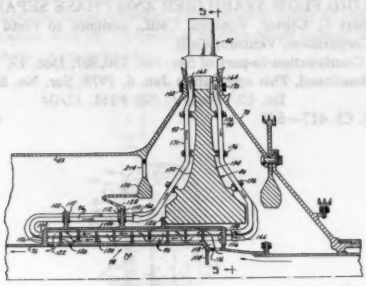
Filed Jun. 3, 1977, Ser. No. 803,167
Int. Cl.[2] F01D *5/08;* **F02C** *7/12*
U.S. Cl. 415—114 **1 Claim**

1. A turbine comprising:
a rotor disk bearing a plurality of hollow blades;
means, including a closed-loop passageway for each of said blades, for individually cooling each of said blades by the thermosiphon principle;

a hollow duct including a conical coolant passage therein, said duct being rotatable with said disk;

a heat exchanger, including an internal chamber, connected to and rotatable with said hollow duct, each of said closed-loop passageways passing through said heat exchanger chamber;

means for introducing a coolant from said coolant passage into said heat exchanger chamber;



labyrinth means for directing the coolant around said closed-loop passageways within said heat exchanger chamber;

means for discharging the coolant from said heat exchanger chamber into said coolant passage; and wherein

said coolant introducing means is located at a lesser radius of said coolant passage than said coolant discharge means.

4,190,399

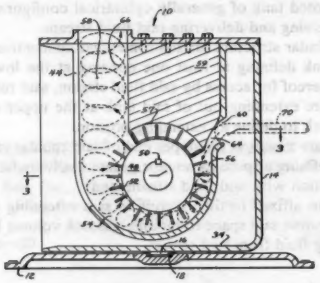
REGENERATIVE TURBINE

William L. Amminger, 239 Ridgefield, Memphis, Tenn. 38111

Filed May 16, 1978, Ser. No. 906,424

Int. Cl.[2] F01D *25/00*; F01K *25/06*

U.S. Cl. 415—116 **14 Claims**



1. An improved fluid-driven regenerative turbine comprising:

a rotor;

a housing having a rotor channel with the rotor mounted therein; the rotor channel having a primary driving fluid inlet region and a fluid outlet region; at least some of the primary driving fluid transferring energy to the rotor and flowing through the rotor channel in a helical path;

a primary fluid inlet channel in the housing providing primary driving fluid to the rotor channel primary fluid inlet region;

an auxiliary fluid inlet channel in the housing for providing auxiliary fluid to the rotor channel outlet region in a direction tangential to the helical path of the primary driving fluid in the rotor channel outlet region so that the helical motion of the fluid in the rotor channel outlet region is intensified.

4,190,400

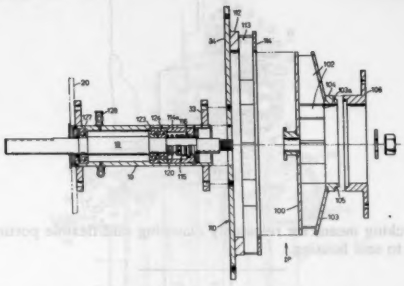
INTEGRAL PUMP AND DRIVE SHAFT ASSEMBLY

Albert H. Sloan, 4201 Kean Rd., Fort Lauderdale, Fla. 33314

Division of Ser. No. 760,535, Jan. 19, 1977, Pat. No. 4,116,582, which is a division of Ser. No. 623,655, Oct. 20, 1975, Pat. No. 4,029,438. This application Jul. 20, 1978, Ser. No. 926,411

Int. Cl.[2] F04B *29/04, 29/08*

U.S. Cl. 415—170 A **7 Claims**



1. A pump and drive shaft assembly comprising: a pump having a pump housing including a back wall, an impeller rotatably mounted in said pump housing, a drive shaft housing detachably but rigidly secured at one end to said back wall of said pump housing and extending therefrom; a tubular seal holder axially fixed in said shaft housing, a drive shaft extending through and rotatably mounted in said shaft housing and connected in driving relationship with said impeller, a first anti-friction bearing means mounted in said shaft housing in abutting relationship with said tubular seal holder and rotatably supporting said shaft in said shaft housing, a flexible fluid seal between said shaft and said tubular seal holder, a mechanical, rotary seal located between said shaft and said tubular seal holder for excluding water from entering said shaft housing from said pump housing, and a second anti-friction bearing means in said shaft housing for supporting said shaft and axially spaced from said first bearing means.

4,190,401

LOCK ASSEMBLY FOR A DRIVE SHAFT OF A FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Eberhard Hofmann, Kirchberg, and Erwin Weyrich, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,670

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652950

Int. Cl.[2] F04B *39/00*

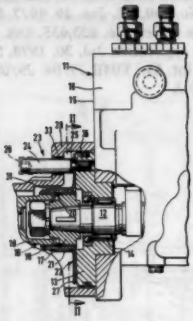
U.S. Cl. 417—313 **3 Claims**

1. A locking assembly for the drive shaft of a fuel injection pump for releasably fixing the rotary position of the shaft within the pump housing at a predetermined point corresponding to the initial point of fuel injection for an internal combustion engine prior to installation of the pump on the engine, comprising:

said pump, including a housing and a drive shaft extending outwardly of said housing;

means firmly connected to said drive shaft for rotation there-

with, said means having a portion which is flexible axially of said shaft; and



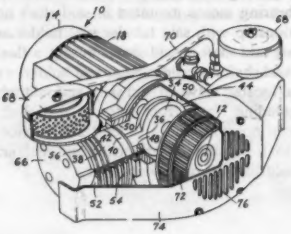
locking means for releasably clamping said flexible portion to said housing.

4,190,402

INTEGRATED HIGH CAPACITY COMPRESSOR

Meredith W. Meece, Monroe; Charles W. Ickes, Farmerville, and Fred H. Moore, Monroe, all of La., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 6, 1975, Ser. No. 575,112
Int. Cl.[2] F04B *35/04, 27/02*
U.S. Cl. 417—415 **6 Claims**



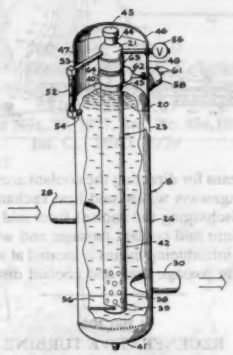
1. An integral reciprocating compressor, comprising:
a motor having a housing and a shaft extending therefrom;
a flywheel mounted on said motor shaft within said housing;
at least one pair of compression chamber forming means;
movable piston members disposed in each of said compression chambers;
means for connecting the piston members to said motor shaft so that the piston members in a pair of compression chambers undergo a simultaneous compression stroke;
a crankcase enclosing both the motor shaft and the means connecting the piston member to the motor shaft, said crankcase also connecting the motor housing and compression chamber forming means so that the compression chambers of a pair are positioned at opposite sides of said motor shaft;
valving means for allowing gas to controllably flow into and out of the compression chambers in response to piston member motion;
a vent window formed in said crankcase adjacent said motor housing;
air circulating means connected to said motor shaft for circulating air through the vent window and the crankcase for cooling the means connecting the piston members to said motor shaft; and
a shroud for directing the air circulated through said crankcase over the compression chamber forming means and the valving means, whereby the circulating air from the vent window first cools the connecting means and then the compression chambers and valving means, said shroud also including a vent opening through which the air circulating means circulates additional air, said additional air being directed by the shroud over the compression chamber forming means for providing additional cooling.

4,190,403

FLUID FLOW STABILIZER AND PHASE SEPARATOR

Robert C. Glover, Ventura, Calif., assignor to Fluid Kinetics Corporation, Ventura, Calif.

Continuation-in-part of Ser. No. 750,307, Dec. 13, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,545
Int. Cl.[2] F04B *11/00;* F16L *55/04*
U.S. Cl. 417—543 **4 Claims**



1. A fluid stabilizer adapted to pass a fluid stream and for absorbing pulsations created by abrupt changes in the fluid stream, comprising:
a closed tank of generally cylindrical configuration for receiving and delivering said fluid stream;
a tubular structure affixed somewhat concentrically in said tank defining at least one opening at the lower portion thereof for access by said fluid stream, said tubular structure extending out of said tank at the upper end of said tank to define an extending portion;
closure means at the upper end of said tubular structure for defining a space to retain a gaseous volume for capacitive action with said fluid stream; and
means affixed to the exterior of said extending portion for heating said space to retain a gaseous volume by vaporizing fluid from said stream.

4,190,404

METHOD AND APPARATUS FOR REMOVING INCLUSION CONTAMINANTS FROM METALS AND ALLOYS

Kenneth E. Drs, Collinsville; Sebastian J. Salafia, Middletown, and Lee F. Schulmeister, Tolland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1977, Ser. No. 860,521
Int. Cl.[2] B22D *27/02, 1/00, 23/08*
U.S. Cl. 425—8 **6 Claims**

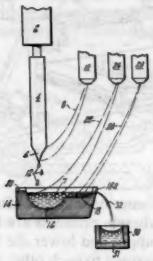
1. A method for removing floating nonmetallic inclusions from a molten pool of metal in a crucible using an electron beam, comprising:
(a) impinging an electron beam onto the surface of the molten pool within the crucible;
(b) segregating floating nonmetallic inclusions in a portion of the pool surface by action of the electron beam;
(c) discharging clean molten metal from another portion of

the pool surface which is substantially freed of inclusions by the beam action;

(d) preventing inclusions from being removed with the clean molten metal flowing from the crucible by manipulation of the beam impingement pattern on the pool surface.

4. Apparatus useful for removing floating nonmetallic inclusions from a molten metal charge, comprising:

(a) a crucible having a chamber for containing a pool of molten metal, a molten metal discharge channel, and an inclusion discharge channel, each channel being in communication with the chamber at diverse points around the periphery of the crucible;



(b) means for introducing metal into the crucible;

(c) means for impinging an electron beam on the surface of a molten pool within the crucible, the beam adapted to maintain metal in the molten state and having an orientation and motion which causes floating inclusions to move toward the inclusion discharge channel;

(d) means for causing molten metal to flow from the crucible through the metal discharge channel;

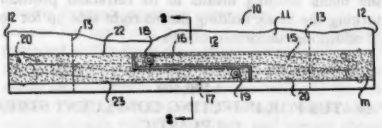
(e) means for receiving clean metal flowing from the metal discharge channel.

4,190,405

HEATING DEVICE FOR A TIRE RETREADING MOLD

Kenneth T. MacMillan, Macon, Ga., assignor to Donald MacMillan & Son, Inc., Macon, Ga.

Filed Jan. 18, 1979, Ser. No. 4,578
Int. Cl.² B29H 5/04
U.S. Cl. 425—20 **15 Claims**



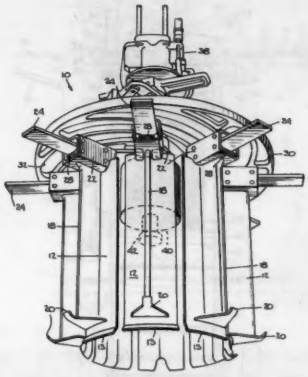
1. A heating device comprising a body having a continuous unending channel therein, a heating element disposed in said channel, said heating element having adjacent opposite end portions, said heating element being generally encased in a body of solid material disposed within said channel, and means formed separate and apart from said channel for traversing said channel and completely separating the solid material encasing one of said end portions from the solid material encasing another of said end portions whereby said end portions are free to move relative to each other upon expansion and/or contraction of said heating element.

4,190,406

APPARATUS FOR POSITIONING AND CURING A PRE-SHAPED TIRE CARCASS

Joseph C. Geck, and Floyd E. Hamilton, both of Detroit, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 730,414, Oct. 7, 1976, abandoned. This application Jul. 19, 1978, Ser. No. 926,051
Int. Cl.² B29H 5/02
U.S. Cl. 425—38 **12 Claims**



1. Apparatus for inserting a bladder of a pneumatic tire vulcanization mold into a pre-shaped partially toroidal raw tire carcass, said apparatus comprising:

transporter chuck means for detachably gripping a first bead of said carcass, said chuck means including a circumferential array of similar and equidistantly spaced segments and control means for selectively increasing and decreasing the effective diametral condition of said circumferential array of segments into and out of engagement with said first carcass bead;

a vulcanization mold section for vulcanizing said carcass into a final toroidal form, said mold section having means for engaging a second carcass bead; said mold section including at its center an endwise movable first piston rod having a free end portion concentrically arranged therein and movably axially relative thereto;

an inflatable vulcanizing bladder capable of assuming both a cylindrical and toroidal form surrounding said first piston rod with said free end portion being exterior of the bladder;

said first piston rod including circular plate means concentrically affixed to said free end portion thereof, said bladder having a circular edge secured to the periphery of said plate means in air-tight relation; said bladder having an opposite circular edge secured to said mold section in air-tight relation;

single-acting means for protracting the first piston rod to cause the bladder to assume the cylindrical form from the toroidal form, the single acting means being exterior to the bladder;

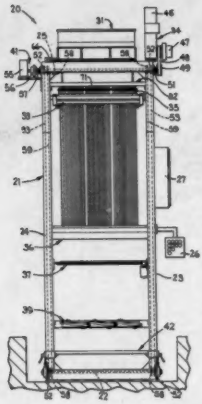
power cylinder means affixed to said transporter chuck means concentrically within said circumferential array of segments, said power cylinder means including a second piston rod having a free end portion that is axially engageable with the free end portion of the first piston rod and thereafter extensible to effect the retraction of the first piston rod and initiate the transformation of the bladder from the cylindrical form to the toroidal form internally of the carcass.

4,190,407

APPARATUS FOR FILLING HEATING TUBE

Steven L. Stroup, Lancaster Township, Wells County, and Galen B. Harman, La Grange, both of Ind., assignors to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Filed Jun. 26, 1978, Ser. No. 919,422
Int. Cl.[2] A23G 1/20
U.S. Cl. 425—110 9 Claims



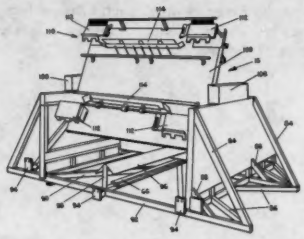
1. In an apparatus for manufacturing sheathed heating elements, including means for supporting a plurality of sheaths to be filled with a particulate material, means for positioning a plurality of resistive elements individually within said sheaths, a plurality of sets of inner and outer concentric filling tubes defining an annular filling passage therebetween for said material, means for positioning said plurality of sets of concentric filling tubes within said sheaths in surrounding relationship to said resistance elements, means for feeding the material through said passage as said tubes are withdrawn from said sheath so as to concentrically position each said resistance element within its respective sheath and to fill said sheath from the bottom thereof with said material, and valve means for controlling the feeding of said material through said passage, comprising the improvement wherein said valve means is directly associated with said inner and outer concentric tubes and is movable between a first opened position permitting flow through said passage into said sheath and a second closed position for positively preventing flow from said passage into said sheath, said valve means including a valve member positioned adjacent the lower ends of said tubes and movable relative to at least one of said tubes between said opened and closed positions, said valve member being fixed to one of said tubes of each set and extending concentrically thereof, said valve member projecting radially relative to said one tube so as to substantially radially span said annular passage, said valve member having a surface positionable closely adjacent a peripheral surface on a lower portion of the other of said concentric inner and outer tubes adjacent the lower end thereof for defining said closed position, and actuating means for causing limited relative axial displacement between said concentric inner and outer tubes for relatively moving said one tube axially downwardly relative to said other tube to thereby position said valve member axially below and spaced downwardly from said lower portion of said other tube, thereby permitting flow from said annular passage into said sheath.

4,190,408

AUTOMATIC LOADING AND UNLOADING APPARATUS FOR PRESS

James W. Bronkema, Grand Rapids, and Norman L. Hoeksema, Zeeland, both of Mich., assignors to Unique Tool & Die Co., Grand Rapids, Mich.

Filed Jun. 26, 1978, Ser. No. 919,155
Int. Cl.[2] B29C 17/00
U.S. Cl. 425—145 13 Claims



1. Apparatus for automatically loading and unloading a compression press wherein products are formed by compressing blanks between upper and lower die halves that are vertically movable with respect to each other to open and close the die, said apparatus comprising:

a frame adapted to be positioned adjacent the press;

blank holding means pivotably mounted in the frame for rotation about a horizontal axis through an angle of at least 180 degrees, the blank holding means including releasable gripping means for engaging and holding the blanks when they are laid on the blank holding means, such that the blanks are releasably retained in place on the blank holding means when the blank holding means is rotated so as to be turned upside down, said blank holding means being longitudinally movable with respect to the frame between a retracted position, wherein the blank holding means is withdrawn from the press, and an extended position, wherein the blank holding means is extended to a position between the separated halves of the die in alignment with the mold cavities in the die; and

control means for actuating the gripping means after uncompressed blanks are placed on the blank holding means, said control means turning the blank holding means upside down when loaded with uncompressed blanks and extending the loaded blank holding means into its extended position in alignment with the mold cavities in the die when the die halves are separated, the control means thereafter releasing the gripping means such that the blanks drop down on the lower die half in position to be compressed, the control means thereafter withdrawing the blank holding means to its retracted position and turning the blank holding means right side up for receipt of additional unformed blanks.

4,190,409

APPARATUS FOR INJECTING CONFLUENT STREAMS OF PLASTIC

Karl Hehl, Arthur-Hehl-Strasse 32 7298, Lossburg 1, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,105
Int. Cl.[2] B29F 1/12
U.S. Cl. 425—132 10 Claims

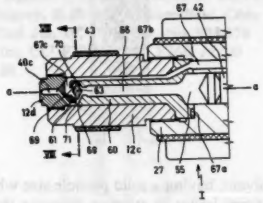
1. An apparatus for injecting confluent streams of plastic material from separate sources into the molding die of an injection molding machine, the apparatus comprising in combination:

first and second injection units, structurally connected to each other, each unit having a plastification cylinder, a plastification screw inside said cylinder, and hydraulic

drive means operative to rotate and axially advance the plastification screw inside the plastification cylinder, thereby plastifying and injecting raw material from the forward end of the respective injection unit;

pulsation generating means operative to control the hydraulic drive means of at least one of the two injection units, for the execution of partial injection strokes, at regular intervals and of consistent displacement, and also operative to control the hydraulic drive means of both injection units, for the execution of alternating partial injection strokes, at regular intervals and of consistent displacement;

an injector nozzle connected to both injection units, said nozzle having a nozzle discharge channel on its forward extremity adapted for engagement against the opening of a sprue channel of the injection molding die, the injection nozzle further enclosing a pulsation chamber upstream of



its discharge channel, and separate pulsation channels leading from the plastification cylinders of the two injection units to the pulsation chamber, so that the raw materials which are injected by the two plastification screws enter the pulsation chamber through entry ports of their separate pulsation channels and, after confluence inside the latter, exit therefrom via the nozzle discharge channel; and

a pulsating element floatingly arranged inside the pulsation chamber of the injector nozzle in such a relationship to the entry ports of the two pulsation channels that an inflow of raw material from one entry port will move the pulsating element into a port-closing position on the other entry port, and vice versa, thereby opening and closing the pulsation channels in unison with the injection pulsations which are being generated by the pulsation generating means.

4,190,410

COOKIE FORMING APPARATUS

Herbert C. Rhodes, 6811 SE. Ash Pl., Portland, Oreg. 97215

Filed Nov. 20, 1978, Ser. No. 962,248

Int. Cl.² A21C *3/10*

U.S. Cl. 425—239 **7 Claims**

1. Cookie forming apparatus comprising:

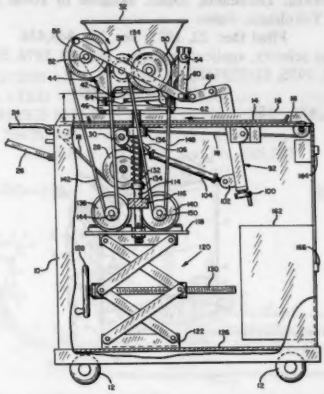
a hopper for receiving cookie dough, said hopper being provided with a die at the bottom thereof having a plurality of apertures through which cookie dough passes for taking on an exterior shape corresponding to the exterior shape of said apertures, and including a pair of adjacently opposed dough rolls positioned in said hopper above said die and rotated in opposite directions for forcing dough toward said apertures and extruding dough through said apertures,

a conveyor located underneath said die for receiving extruded dough therefrom,

a cutoff wire and a bail supporting said cutoff wire in alignment between said die and said conveyor in position for severing dough extruded through said die by said rolls,

first drive motor means having a driving connection with said conveyor and said bail for operating said conveyor and bail in predetermined relation causing said bail to pass said cutoff wire successively through extruded dough to provide cookie-shaped dough deposits on said conveyor and for moving said conveyor to receive cookie-shaped deposits at spaced locations as provided by successive operation of said bail,

said second drive motor means independent of said first drive motor and having a driving connection to said



dough rolls for turning said dough rolls independently from said first drive motor means, said last mentioned drive motor means being separately adjustable for determining the speed of rotation of said dough rolls and correspondingly the quantity of dough extruded through said apertures for each deposit severed by said cutoff wire.

4,190,411

CENTRIFUGAL POTTING APPARATUS

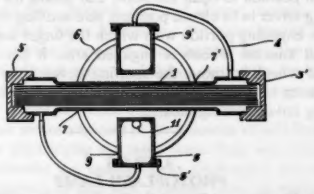
Yoshiaki Fujimoto, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Aug. 1, 1978, Ser. No. 929,891

Claims priority, application Japan, Aug. 4, 1977, 52/94283

Int. Cl.² B29C *5/04, 1/00*

U.S. Cl. 425—434 **6 Claims**



1. Centrifugal potting apparatus comprising:

a rotator adapted for rotation about an axis of rotation;

a housing mounted on said rotator and disposed essentially symmetric with respect to said axis of rotation,

said hausing being provided with a pair of potting cases each spaced from said axis of rotation and adapted to receive a potting agent therein upon rotation of said rotator;

a pair of individual container means respectively associated with said pair of said potting cases and each adapted for holding a separate source of a potting agent to be delivered to the corresponding potting case under centrifugal force produced by rotation of said rotator, each of said container means being secured to a side of said rotator and in spaced relationship to said axis of rotation; and

tube means operably coupling said pair of container means with the respectively associated potting cases for deliver-

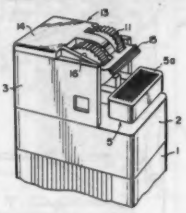
ing potting agent from the former to the latter upon rotation of said rotator.

4,190,412

DISPOSABLE CIGARETTE GAS LIGHTER WITH SNUFFING COVER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Yokohama, Japan

Filed Dec. 22, 1977, Ser. No. 863,436
Claims priority, application Japan, Dec. 28, 1976, 51/158519; Dec. 28, 1976, 51/175768[U]
Int. Cl.[2] F23Q *25/00*
U.S. Cl. 431—151 **6 Claims**



1. A disposable cigarette gas lighter comprising a plastic fuel reservoir for retaining therein liquified inflammable gas and an operative lighter assembly mounted thereon, said lighter assembly including a flint holding means for holding a flint element, a sparking wheel provided with a pair of knurled wheels secured thereto, a spring element provided in the flint holding means for biasing the flint element onto the sparking wheel, a shaft for rotatably mounting the sparking wheel, a fuel nozzle for connecting the interior of the reservoir with the ambient air, a shut-off valve including means biasing it to a closed position incorporated in the nozzle, a valve opening lever for opening the shut-off valve, and a windbreak wall secured on the reservoir to surround the nozzle, wherein the improvement comprises a snuffing cover and means mounting said snuffing cover for rotational movement independent of said knurled wheels and valve opening lever between a closed position to close an open upper end of said windbreak wall and an open position to open the same, and means for holding the snuffing cover in its closed position, said snuffing cover having a finger engaging portion with which the finger used for rotating said knurled wheels is engaged after it has rotated the knurled wheels to move the snuffing cover from said closed position to said open position overcoming the force of said snuffing cover holding means.

4,190,413

PHOTOFLASH LAMP

John W. Shaffer, and Daniel W. Bricker, both of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 30, 1977, Ser. No. 865,987
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—362 **13 Claims**

1. A photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope,
a quantity of filamentary combustible material located within said envelope;
a combustion-supporting gas in said envelope;
and ignition means disposed in said envelope in operative relationship with respect to said combustible fill material, said ignition means including a pair of lead-in wires extending into said envelope in a spaced relationship, and a dried coating of primer material covering a portion of at least one of said lead-in wires within said envelope, said coating of primer material having been provided from a mixture comprising a particulate fuel, a binding agent, a solvent and a relatively coarse additive of electrically nonconducting inert particulate material;
said additive of inert particulate material being insoluble in

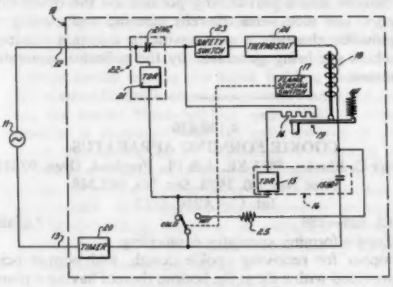
said solvent, having a solid particle size which is about 10 to 50 times larger in average diameter than that of said particulate fuel, and being present in an amount from about 10 to 60 weight percent of the dried mixture.

4,190,414

FAIL-SAFE GAS FEED AND IGNITION SEQUENCE CONTROL APPARATUS AND METHOD FOR A GAS-FIRED APPLIANCE

Richard A. Elmy, Louisville, Ky.*, assignor to W. M. Cissell Manufacturing Company, Louisville, Ky.

Filed Apr. 17, 1978, Ser. No. 897,183
Int. Cl.[2] F27D *19/00*; F23N *5/00, 5/20*
U.S. Cl. 432—46 **9 Claims**



1. A fail-safe combustion control apparatus for controlling the gas feed and ignition sequence in a gas-fired appliance, comprising circuitry including:
power leads selectively connected to an external source of electrical power;
an incandescent igniter for kindling gas to provide a flame;
a gas feed time delay switch means having an operator and a normally open contact;
a flame sensing means having a cold contact and a hot contact for detecting said flame;
a time delay lockout switch means having an operator and a normally closed contact;
said incandescent igniter, said gas feed time delay switch means operator, said normally closed contact of said time

delay lockout switch means and said cold contact being connected in series across said power leads;

a solenoid means for controlling a gas valve;

said solenoid means, said normally closed contact of said time delay lockout switch means and said normally open contact of said gas feed time delay switch means being connected in series across said power leads;

said time delay lockout switch means operator and said cold contact being connected in series across said power leads; and

a holding resistor;

said holding resistor, said hot contact, said solenoid means and said normally closed contact of said time delay lockout switch means being connected in series across said power leads.

4,190,415

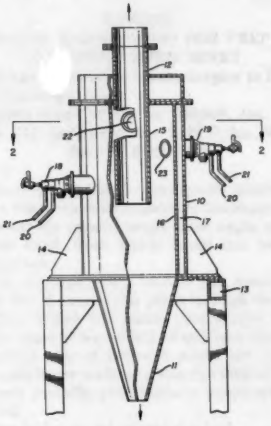
CHIP DRYING AND CLEANING DEVICE

Raymond E. Singrey, R.D. #1, Williamsfield, Ohio 44093

Filed Jul. 10, 1978, Ser. No. 923,474

Int. Cl.[2] F27B *15/00*; F26B *17/00*

U.S. Cl. 432—58 **3 Claims**



1. A chip or sand drying and cleaning device comprising a vertically positioned cylindrical body forming a hollow unrestricted oxidizing chamber, an open ended cone-shaped bottom on the lower end of said cylindrical body, a closure on the upper end thereof, at least two tangentially mounted burners on said cylindrical body in communication therewith, a fuel source for said burners, means located above said burners for delivering contaminated material into said cylindrical body, said burners and the products of combustion therefrom acting to create a high velocity cyclonic vortex whereby the contaminates are oxidized, tubular means extending downwardly through said closure centrally thereof for exhausting said products of combustion and said oxidized contaminates, the lower intake end of said tubular means communicating within said oxidizing chamber centrally thereof and below said burners and within said cyclonic vortex, the inner area of said cylindrical body being at least double the area of the tubular means for exhausting the products of combustion so that said cyclonic vortex will be unimpeded in imparting centrifugal spin to said contaminated material so as to carry it below said intake end of said tubular means and into said open ended cone-shaped bottom.

4,190,416

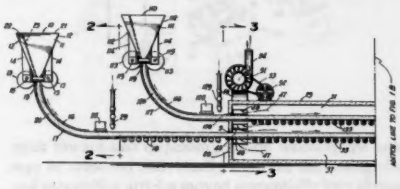
PROCESS AND APPARATUS FOR PRODUCING CELLULATED VITREOUS REFRACTORY MATERIAL IN PRESCRIBED SHAPES AND PRODUCTS THEREFROM

John W. North, 3467 Pierce Dr., NE., Chamblee, Ga. 30341

Filed Mar. 20, 1978, Ser. No. 888,507

Int. Cl.[2] F27B *9/02*

U.S. Cl. 432—128 **22 Claims**



1. Apparatus for firing of refractory raw material comprising:

(a) a longitudinally disposed kiln defining a pair of tandem arranged first and second chambers, said kiln having openings defining a front entrance port and a rear exit port for raw material;

(b) conveyor means in said chamber for feeding said raw material from said entrance port along a prescribed path successively through said first chamber and through said second chamber and out of said exit port;

(c) heating means in said second chamber for firing said raw material as it passes therethrough, said heating means including longitudinally spaced burners for firing transversely across the path of said material;

(d) conduit means connected to said kiln and communicating with said first chamber and said second chamber for directing stack gases formed by the gases heated by said heating means from said first chamber into the forward portion of said second chamber, said kiln having wall ports in said second chamber respectively opposite said burner means for receiving gases therefrom;

(e) exhause means adjacent to the entrance of said first chamber for discharging the stack gases from said first chamber, whereby the heating gases discharged into the forward portion of said first chamber through said conduit means are moved rearwardly adjacent to said raw material in counterflow relationship for drying and then preheating said raw material; and

(f) delivery means for delivering said raw material into said entrance.

4,190,417

PROCESS FOR DYEING AND PRINTING SHEETS

Helmuth Prochaska, Warren, N.J.; Gert F. Baumann, Pittsburgh, Pa.; Peter Rasche, Aachen, Fed. Rep. of Germany; Heinz Müller, and Alberto Gonzales-Dörner, both of Leverkusen, Fed. Rep. of Germany, assignors to Mobay Chemical Corporation, Pittsburgh, Pa. and Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 846,867

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651392

Int. Cl.[2] D06P *1/00*

U.S. Cl. 8—2.5 R 14 Claims

1. Process for dry dyeing or printing of sheet-like structures by transfer printing, characterized in that said structures are brought into close contact, under pressure and at a temperature of about 160° to 350° C., with an unsupported foam sheet having a weight per unit area of 3 to 200 g/m^2 which has been dyed and/or printed with water insoluble dyes and which softens at this temperature, the said contact being maintained until the foam structure of the sheet has been substantially destroyed.

4,190,418

APPARATUS AND METHOD FOR PREPARING GRADIENT DYED SHEET

Harold O. Buzzell, Wollaston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 649,049, Jan. 14, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,355

Int. Cl.[2] D06P *7/00*

U.S. Cl. 8—4 16 Claims

1. A method of providing a dye density gradient to a web comprising a relatively small transverse dimension and top and bottom substantially parallel longitudinal edges, said web providing a lens stock from which lenses can be cut, which method comprises:

conducting said web into a bath of dye material in such a manner that the transverse plane through the longitudinal dimension of said web makes substantially a right angle with the plane of the surface of said bath and said bottom longitudinal edge of said web enters said dye bath at an acute angle to the surface of said dye bath so that the web is at least partially progressively immersed in said dye bath, and

conducting said web out of said dye bath

whereby a transverse dye density gradient is established on said web as a function of the residence time of the various portions of said web in said dye bath.

4,190,419

DEVICE FOR DETECTING SERUM BILIRUBIN

Robert Bauer, Bristol, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 22, 1978, Ser. No. 944,718

Int. Cl.[2] G01N *31/22, 33/16*

U.S. Cl. 23—230 B 10 Claims

1. A test device for the detection of bilirubin in a serum sample which device comprises a carrier and, incorporated therewith, a composition comprising a diazonium salt, p-toluenesulfonic acid and dyphylline.

4,190,420

CONTAINER FOR DISPENSING ARTICLES TO AN AUTOMATED ANALYZER

Roger G. Covington; Stephen H. Miller, both of Rochester, and Archie J. Tucker, Middlesex, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,289

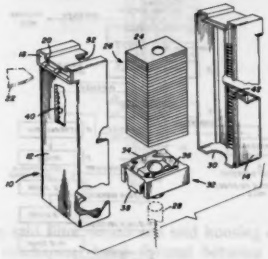
Int. Cl.[2] G01N *1/28;* B65D *83/10*

U.S. Cl. 422—63 8 Claims

1. A container for receiving and dispensing reagent articles of predetermined thickness to apparatus having a movable actuator and adapted to use the articles to carry out quantitative chemical analysis of fluid samples, said container comprising:

a casing having a chamber adapted to receive a stack of the articles and having an article dispensing station at which articles may be removed from said chamber for delivery to the apparatus;

a movable stack positioning element in said chamber engageable with one end of a received article stack to urge the



stack toward said dispensing station whereby the articles may be removed individually from the dispensing station and succeeding articles moved scquentially into alignment with the dispensing station, said stack positioning element being movable by the actuator a predetermined distance each time any but the last article is removed from said dispensing station; and

means for causing said element to be moved a distance different from said predetermined distance when the last article is removed from said dispensing station.

4,190,421

FIRESIDE TREATING COMPOSITIONS

Chih M. Hwa, Palatine, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Filed Jul. 17, 1978, Ser. No. 925,007

Int. Cl.[2] C10L *9/00, 10/00*

U.S. Cl. 44—4 2 Claims

1. A fireside treating composition consisting essentially of a mixture of powdered coal and a fuel additive in a coal:additive ratio of 1:10 to 10:1, in which the additive is a member selected from the group consisting of ammonium chloride, magnesium oxide, alumina, and copper carbonate.

2. Method of feeding a fireside additive to a boiler furnace characterized in that the additive is contained in the composition of claim 1.

4,190,422

METALLIC ABRASIVE PRODUCED FROM A STEEL MILL WASTE MATERIAL

Henry W. Hitzrot, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 906,310, May 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,116, May 24, 1977, abandoned. This application Dec. 1, 1978, Ser. No. 965,550

Int. Cl.[2] C21D *7/06;* B24C *1/10*

U.S. Cl. 51—309 20 Claims

1. A method for preparing scarfer spittings comprised of steel cores enclosed in shells of iron oxides and being within a size range of plus 50.8 mm to about minus #100 sieve size for use as size-graded steel abrasives useful in blast cleaning metallic and non-metallic surfaces, comprising:

(a) screening said scarfer spittings in a first screening step to separate large non-usable spittings from smaller spittings and to remove foreign matter,

(b) charging said smaller spittings into a grinding mill,
(c) removing said shells of iron oxides from around said cores of said smaller spittings in said mill,
(d) screening the mixture produced in step (c) in a second screening step to separate said steel cores from said iron oxide shells,
(e) drying said steel cores, and
(f) screening said steel cores in a third screening step to produce a size-graded metallic abrasive product.

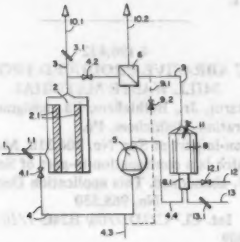
13. A size-graded steel abrasive material for blast cleaning metallic and non-metallic surfaces characterized by having a hardness within the range of R_c 20 to 35, a microstructure comprised of untempered lath-like martensite substantially free from intergranular and intragranular cracking, a grain size of about 3 to 4 and having an impact toughness equivalent to that of higher carbon and alloy grades of metallic abrasives.

4,190,423

METHOD OF OPERATING AN ADSORPTION FILTER

Karl Winter, Dortmund-Sölde, Fed. Rep. of Germany, assignor to CEAG Ceagfilter und Entstaubungstechnik GmbH, Dortmund, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 880,224
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1977, 2707226
Int. Cl.² B01D *53/04*
U.S. Cl. 55—20 **4 Claims**



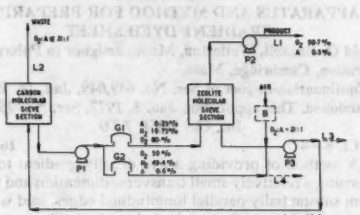
1. Method of separating vaporous or gaseous impurities from an air or gas flow by means of an adsorption filter wherein, after the filter has attained a predetermined loading of the impurities, the combination therewith of (1) conducting an inert gas in a circulatory loop through the adsorption fulter containing impurities to desorb same; (2) removing excess gas together with desorbed components contained in the excess gas from said circulatory loop and sending same to a combustion chamber where it is consumed; and (3) supplying heat energy for the desorption of the adsorption filter by conducting indirect heat exchange between the combustion chamber exhaust gas and the inert gas in the circulatory loop.

4,190,424

GAS SEPARATION

John W. Armond, Buckhurst Hill; David A. Webber, Bishops Stortford, and Kenneth C. Smith, Roydon, all of England, assignors to BOC Limited, London, England

Continuation-in-part of Ser. No. 702,497, Jul. 6, 1976, abandoned. This application Dec. 28, 1977, Ser. No. 865,131
Claims priority, application United Kingdom, Jul. 17, 1975, 30093/75
Int. Cl.² B01D *53/04*
U.S. Cl. 55—58 **15 Claims**



1. A gas separation process employing a first section including at least one bed of molecular sieve carbon operated on a pressure swing adsorption cycle and a second section including at least one bed of zeolite molecular sieve operated on a pressure swing adsorption cycle, the process comprising: supplying a gas mixture containing oxygen, nitrogen and argon as feedstock to said first section; said first section providing, during a desorption step thereof, a first gas stream enriched in oxygen and depleted in nitrogen and argon as compared to said gas mixture; supplying such oxygen-enriched argon depleted gas as feedstock to the second section; said second section providing, during a feed step thereof, a second gas stream further enriched in oxygen and depleted in nitrogen than said first gas stream and providing, during a desorption step thereof, a third gas stream enriched in oxygen as compared to said gas mixture but less so than said second gas stream; and supplying said third gas stream to said first section to comprise part of the feedstock thereof.

8. A gas separation process employing a first section including at least one bed of zeolite molecular sieve operated on a pressure swing adsorption cycle and a second section including at least one bed of molecular sieve carbon operated on a pressure swing adsorption cycle, the process comprising: supplying a gas mixture containing oxygen, nitrogen and argon as feedstock to said first section; said first section providing, during a feed step thereof, a first gas stream enriched in oxygen and depleted in nitrogen as compared with said gas mixture; supplying such oxygen-enriched gas as feedstock to the second section; said second section providing, during a desorption step thereof, a second gas stream further enriched in oxygen than said first gas stream and depleted in argon, and providing, during a feed step thereof, a third gas stream enriched in oxygen as compared to said gas mixture but less so than said second gas stream; and supplying said third gas stream to said first section to comprise part of the feedstock thereof.

4,190,425

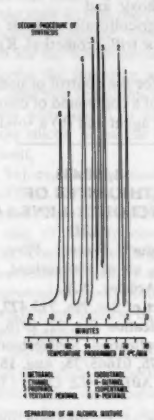
PROCESS FOR THE PREPARATION OF SILICIOUS POLYMERIC MATERIALS AND THEIR APPLICATIONS IN THE SEPARATION OF FLUIDS IN GASEOUS PHASE

Wilhelm Brüening, and Inäi M. R. deA. Brüening, both of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A.-Petrobas, Rio de Janeiro, Brazil

Continuation of Ser. No. 723,267, Sep. 14, 1976, abandoned, which is a continuation of Ser. No. 421,871, Dec. 5, 1973, abandoned. This application Jun. 28, 1978, Ser. No. 919,656

Int. Cl.[2] B01D *15/08*

U.S. Cl. 55—67 15 Claims



1. A process for separating the components of a mixture of non-polar organic compounds by gas phase chromatography comprising passing said mixture in a gaseous state through a solid stationary phase of micro-porous free flowing powder having a high surface area and good thermal stability, said phase comprising an intimate mixture of an organic macro molecular component (A) and (B) non-porous high purity silica in particles smaller than 500 angstroms which does not contain calcium, sodium or magnesium and is substantially free of metallic oxides, said silica having a surface area greater than 50 m^2/g, said macro molecular component (A) having been intimately mixed with the silica (B) by reaction of the monomeric components forming the macro molecular component (A) in the presence of said silica, whereby said silica particles are intimately disseminated throughout organic macro molecular chains without coordinate chemical bonding linkages between the silica and the organic macro molecular component.

4,190,426

GAS SEPARATING AND VENTING FILTER

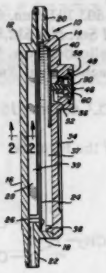
Ricky R. Ruschke, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 30, 1977, Ser. No. 856,147

Int. Cl.[2] B01D *46/00*

U.S. Cl. 55—185 11 Claims

1. A gas separating and venting filter comprising: a plastic heat-deformable plastic housing having walls defining an interior chamber, inlet opening means in said housing for conveying fluid into said chamber, one of said walls comprising liquid-wetting filter means for passing liquid only therethrough, outlet means downstream of said liquid-wetting filter means for conveying liquid therefrom, vent opening means in said housing communicating between the outside of said housing and said interior chamber to vent gas from said chamber, and planar liquid-repellent filter means covering said vent opening means and having a peripheral edge portion overlying said housing and sealed thereto to permit the passage of gas but to prevent liquid from escaping through said vent opening means, said liquid-repellent filter means comprising a plastic liquid-repellent filter membrane with a plastic fibrous backing disposed between said membrane and said housing, said filter means having a higher melt temperature than said housing, said



seal between said filter means and said housing comprising a continuous mechanical bond formed between said fibrous backing and said housing in which portions of said housing fill the interstices in portions of said fibrous backing.

4,190,427

PLANT CARE COMPOSITION

Robert J. Ravallo, Mahopac, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed May 4, 1977, Ser. No. 793,693

Int. Cl.[2] C05B *15/00;* C05C *9/00*

U.S. Cl. 71—29 5 Claims

1. An essentially anhydrous composition adapted for dispersion in a foamed state for treatment of vegetation or terrain comprising:

a. urea, urea-formaldehyde, potassium tripolyphosphate, and

b. an isopropyl alcohol and,

c. an effective amount of a long chain alpha olefin sulfonate containing at least 8 carbon atoms as a foam agent.

4,190,428

PLANT TREATING COMPOSITION

Martin S. Colton, Avon; Esra Pitchon, Flushing, and Robert J. Ravallo, Mahopac, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 4, 1977, Ser. No. 793,802

Int. Cl.[2] C05B *15/00;* C05C *9/00*

U.S. Cl. 71—29 6 Claims

1. A dry particulate plant treating composition foamable with water comprising:

a. urea-formaldehyde, urea, potassium tripolyphosphate and ferrous sulfate, and

b. a solid foaming agent, and

c. an alcohol of limited solubility which is soluble to the extent of approximately 15 to 20 parts per 100 parts of water or less.

4,190,429

CONTROL OF MICROBIAL CONTAMINATION

Jerry L. Rutter, Overland Park, Kans.; Janice M. Bergman, Kansas City, Mo., and Kurt J. Bevernitz, Mission, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1978, Ser. No. 934,305

Int. Cl.[2] A01N *9/20*

U.S. Cl. 71—67 3 Claims

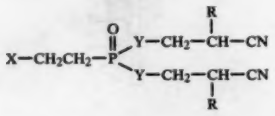
1. A method of inhibiting the growth of contaminating microorganisms which comprises contacting the microorganisms with an effective amount of N-adamantyl gluconamide.

4,190,430
DI-(CYANOALKYL)-β-HALOETHANEPHOSPHONATES AND DITHIOPHOSPHONATES AND USE AS PLANT GROWTH REGULATORS

Werner Trueb, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 803,792, Jun. 6, 1977, Pat. No. 4,137,064, which is a division of Ser. No. 612,501, Sep. 11, 1975, Pat. No. 4,042,370. This application Nov. 9, 1978, Ser. No. 959,209
Claims priority, application Switzerland, Sep. 18, 1974, 12677/74
Int. Cl.² A01N 9/36; C07F 9/40
U.S. Cl. 71—86 9 Claims

1. A compound of the formula:



wherein
X is chlorine or bromine,
Y is oxygen or sulfur, and
R is hydrogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, unsubstituted phenyl or phenyl substituted by one or more members selected from the group consisting of fluoro, chloro, bromo, cyano, carboxy, C_2–C_8 alkoxycarbonyl, C_2–C_8 alkylcarbamoyl, trihaloalkyl, C_1–C_8 alkylsulphinyl, unsubstituted phenylsulphinyl, phenylsulphinyl substituted by a methyl or ethyl group or two methyl groups, C_1–C_8 alkylsulphonyl, unsubstituted phenylsulphonyl, phenylsulphonyl substituted by a methyl or ethyl group or two methyl groups, and nitro.

3. A method of regulating the growth of plants or regulating plant secretion by applying to the plants a plant growth or secretion regulating effective amount of a compound according to claim 1.

4,190,431
SUBSTITUTED OXADIAZOLIDINE-3,5-DIONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 535,323, Mar. 18, 1966, Pat. No. 3,437,664. This application Nov. 17, 1967, Ser. No. 703,497
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 1 Claim

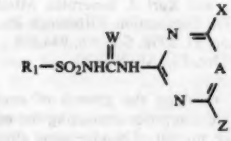
1. A method of destroying undesired vegetation which comprises applying to said vegetation a herbicidally effective amount of the compound 2-(3',4'-dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione.

4,190,432
HERBICIDAL SULFONAMIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1977, Ser. No. 820,882
Int. Cl.² C07D 251/18, 251/52; A01N 9/22, 9/12
U.S. Cl. 71—93 37 Claims

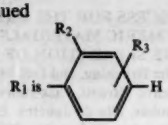
1. A compound selected from



(I)

where

-continued



R_2 and R_3 are independently hydrogen, fluorine, chlorine, bromine, methyl, methoxy, nitro or trifluoromethyl;
W is oxygen or sulfur;
X is $-NHCH_3$ or $-N(CH_3)_2$;
Z is methyl or methoxy; and
A is N and their agriculturally suitable salts provided that when R_2 is nitro or trifluoromethyl, R_3 can not be nitro or trifluoromethyl.

13. A composition for the control of undesirable vegetation consisting essentially of a compound of claim 1 and at least one of (a) a surface active agent and (b) a solid or liquid diluent.

4,190,433
THIOESTER OF 1,2-DIPHENYL-CYCLOHEX-1-ENE-4-CARBOXYLIC-ACID

Verena Laanio, Arisdorf; Werner Föry, Basel, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 713,477, Aug. 11, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,210
Claims priority, application Switzerland, Aug. 15, 1975, 01664/75; Aug. 15, 1975, 01665/75; Aug. 15, 1976, 01666/75
Int. Cl.² A01N 9/12; C07C 153/11
U.S. Cl. 71—100 3 Claims

1. The methyl ester of 1,2-diphenyl-cyclohex-1-ene-4-thiocarboxylic-acid.

4,190,434
THERMAL PROCESSES FOR THE PRODUCTION OF MAGNESIUM

René Bonfils, Barbazan; André Ména, Saint Beat; Christian Payn, Barbazan, and Louis Septier, Le Fayet, all of France, assignors to Societe Francaise d'Electrometallurgie "Sofrem", Paris, France

Filed Jun. 14, 1978, Ser. No. 915,387
Claims priority, application France, Jun. 24, 1977, 77 20227
Int. Cl.² C22B 4/00
U.S. Cl. 75—10 R 7 Claims

1. A thermal process for the production of magnesium in a closed electric furnace in which magnesium oxide and a metallic reducing agent react in the presence of a molten slag to produce magnesium vapors which are transmitted from the reaction furnace to a condensation zone wherein the vapors are condensed to magnesium, the improvement wherein at least a part of the magnesium oxide is introduced into the furnace in the form of a slag from the manufacture of ferro-chromium and which contains at least 20% by weight magnesium oxide and at least 25% by weight aluminum oxide, and in which the molten slag is formed essentially of lime, silica and alumina present in the molecular ratio of $CaO/SiO_2$of at least 1.8 and Al_2O_3/SiO_2 of at least 0.26.

4,190,435
PROCESS FOR THE PRODUCTION OF FERRO ALLOYS

M. K. Olof Johnsson, Degerfors; Rune H. Lindström, Hagfors; Per-Åke Lundström, Hagfors, and Lars-Gunnar Norberg, Hagfors, all of Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Oct. 25, 1978, Ser. No. 954,464
Int. Cl.² C21C 5/52
U.S. Cl. 75—12 6 Claims

1. Process for the production of ferro alloys having a low

carbon content and containing in addition to iron at least one metal selected from the group consisting of manganese, chromium and molybdenum, characterised in that the process comprises the following steps which are repeated cyclically;

(a) adding to a converter containing a melt sump of the of the product to be produced, and a slag rich in oxide of chromium and/or manganese, in addition to iron, a silicon-containing or aluminum-containing reducing agent having an excess of silicon or aluminum respectively for reduction of the said oxides in the slag,

(b) intimately mixing the reducing agent with the slag by injecting a fluid into melt via at least one tuyere beneath the surface of the melt so that the melt, slag and reducing agent are intensively agitated, maintaining the temperature in the melt for the whole period above liquidus temperature, whereby the intensive agitation creates good conditions for effective reduction of metal oxides in the slag by reaction with silicon or aluminum respectively, while the excess silicon or excess aluminum remain dissolved in the melt,

(c) adding lime before, simultaneously with, and/or after said injection of fluid, the lime, being added in the quantity required to fix the silicic acid or aluminum oxide forming,

(d) tapping the slag of reduced chromium or manganese content from the converter when most of the said oxides in the slag have been reduced by said reducing agents,

(e) injecting a pulverulent concentrate containing an oxide of chromium and/or manganese by means of a carrier gas through the said tuyeres,

(f) adding lime before, simultaneously with and/or after injection of the said oxide concentrate,

(g) supplying heat to the melt during the injection of the oxide concentrate, by means of the electric induction, so that the temperature in the melt is for the whole period kept above the melt liquidus temperature, while the excess silicon or aluminum in the melt after being supplied with the said reducing agent reduces the injected metal oxides,

(h) continuing the injection of said oxide concentrate until the silicon content in the melt is reduced to the required content, whereby at the same time quantities of chromium and/or manganese are oxidized and go into the slag, which thus becomes rich in oxides of the said metals, and

(i) tapping the finished ferro-alloy through a tap hole beneath the slag surface, except for a melt sump ferro-alloy which is a volume sufficient to fill the space surrounded by the electric induction heating means, and repeating the process by a new addition of a reduction agent.

4,190,436

AIR MIX AGITATION FOR THE EXTRACTION OF METALS FROM LEACHABLE ORES

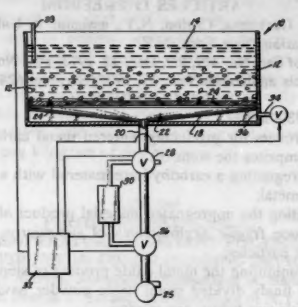
Robert M. Hughes, 10039 Bristol, Alta Loma, Calif. 91701

Filed Dec. 20, 1977, Ser. No. 862,335

Int. Cl.[2] C22B *11/08*

U.S. Cl. 75—105 **8 Claims**

1. In the art of cyanidization of ore for the extraction of precious or other metals or elements an improved process for extracting such metals or elements from ore or other material wherein the improvement is comprised of, agitating and oxygenating pulverized ore or material immersed within a cyanide or other leaching solution by introducing timed or regulated bursts of air into a container containing said pulverized ore or material and said cyanide or other solution in a cyclic or regulated manner over a period of time ranging from 10 to 30 hours whereby a pregnant solution containing the desired elements or metals will be formed and allowing said solution to drain



from said container while providing a continuous flow of air into said solution.

4,190,437

LOW THERMAL EXPANSION NICKEL-IRON BASE ALLOY

William J. Boesch, Utica, and Gernant E. Maurer, New Hartford, both of N.Y., assignors to Special Metals Corporation, New Hartford, N.Y.

Continuation-in-part of Ser. No. 858,590, Dec. 8, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,715

Int. Cl.[2] C22C *38/08, 38/10*

U.S. Cl. 75—122 **14 Claims**

1. An alloy suitable for high temperature service and characterized by low thermal expansion and substantial freedom from notch sensitivity and deleterious microshrinkage, consisting essentially of 30 to 50% nickel, 10 to 20% cobalt, up to 5% columbium, up to 3% tantalum, up to 2.5% titanium, up to 0.1% carbon, up to 2.0% aluminum, 0.06 to 0.3% boron, up to 0.1% zirconium, up to 0.1% rare earth elements, up to 1.0% hafnium, balance essentially iron, the alloy being characterized in containing a eutectic boride.

4,190,438

AMORPHOUS MAGNETIC ALLOY

Koichi Aso; Satoru Uedaira; Shigeyasu Ito; Hidemasa Tamura, and Yoshimi Makino, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1978, Ser. No. 940,172

Claims priority, application Japan, Sep. 12, 1977, 52-109746

Int. Cl.[2] C22C *38/02*

U.S. Cl. 75—123 B **4 Claims**

1. An amorphous magnetic alloy consisting essentially of:

(A) from 2 to 20 atomic % ruthenium;

(B) from 10 to 30 atomic % of at least one amorphous element selected from the group consisting of phosphorus, carbon, silicon, boron, and germanium;

(C) from 0 to 20 atomic % cobalt, nickel, or mixtures of the two, and

(D) the balance being at least 70 atomic % iron.

4,190,439
PROCESS FOR THE PREPARATION OF FINE GRAIN METAL CARBIDE POWDERS AND SINTERED ARTICLES THEREFROM

Frank P. Gortsema, Croton, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 429,269, Dec. 28, 1973, Pat. No. 3,932,594.
This application Oct. 21, 1975, Ser. No. 624,401
Int. Cl.[2] B22F *1/00*
U.S. Cl. 75—211 **10 Claims**

1. A process for producing sintered metal carbide articles which comprises the steps of:

(a) impregnating a carbohydrate material with a compound of a metal;

(b) igniting the impregnated material product of step (a) to produce fragile agglomerates of sub-micron size metal oxide particles;

(c) comminuting the metal oxide product of step (b) to produce finely divided metal oxide powder having a mean particle size below one micron;

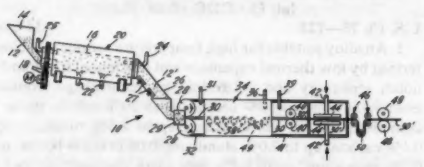
(d) heating said metal oxide powder in an atmosphere of methane and hydrogen to convert said metal oxide powder to metal carbide powder;

(e) compressing and sintering said metal carbide powder into a shaped article.

4,190,440
PROCESS FOR FABRICATING STEEL FROM FERROUS METAL PARTICLES

Albert J. Klein, Arlington Heights; Chiou-Tse Chen, Buffalo Grove, and Lou Kohl, Palatine, all of Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 809,794, Jun. 24, 1977, abandoned.
This application Oct. 19, 1978, Ser. No. 952,789
Int. Cl.[2] B22F *3/00, 1/00*
U.S. Cl. 75—211 **54 Claims**



1. A process for producing steel strip comprising:

(a) providing as-water-atomized ferrous metal powder whose particles have a martensitic structure, a surface layer of mostly iron oxide thereon, a particle size distribution range which includes no more than traces of about 20 mesh, no more than about 16 weight percent smaller than 230 mesh and the balance between 20 and 230 mesh and a total oxygen content of up to about 1.5 weight percent;

(b) heating said particles at a temperature between about 900° and 1200° F. for a conditioning period of at least about 10 but no longer than about 30 minutes while simultaneously agitating said particles and continuously flooding them with a controlled reducing atmosphere in sufficient volume to maintain the reducing action throughout said conditioning period to dry the powder particles and to substantially reduce the oxygen content of reducible iron oxides in the surface layer and to reduce the total oxygen content of the powder particles to less than about 0.30 weight percent, thereby obtaining free-flowing, substantially non-agglomerated, un-annealed conditioned, ferrous powder particles having a tempered martensitic structure and a porous, substantially pure ferrite layer thereon;

(c) compacting said heated particles in a controlled reducing or neutral atmosphere to produce a hot compacted strip;

(d) further heating said compacted strip in a controlled reducing or neutral atmosphere to between 1800°–2400° F.;

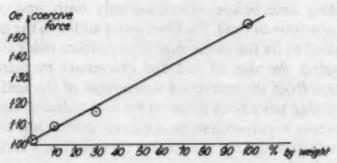
(e) hot-rolling said heated compacted strip in a controlled neutral or reducing atmosphere; and

(f) cooling said hot-rolled strip to between 200°–400° F. in a controlled reducing or neutral atmosphere.

4,190,441
POWDER INTENDED FOR POWDER METALLURGICAL MANUFACTURING OF SOFT MAGNETIC COMPONENTS

Jan R. Tengzelius, Viken, Sweden, and Robert R. Fayles, Moorestown, N.J., assignors to Hoganas AB Fack, Hoganas, Sweden

Filed Mar. 2, 1978, Ser. No. 882,741
Int. Cl.[2] C22C *38/00, 1/04*
U.S. Cl. 75—251 **10 Claims**



1. In an improved composition, for the powder metallurgical manufacture by sintering of soft magnetic components which consists essentially of powdered iron and phosphorus, the latter being present in an amount of up to about 1.5% by weight of said composition, the improvement which comprises: said powdered iron being at least about 99.8% pure and containing less than about 5% by weight of particles exceeding 35 Tyler mesh (417 μm) and less than about 20% by weight of particles less than 100 Tyler mesh (147 μm), the remainder of the particles being in the range between about 35 and 100 Tyler mesh (417 and 147 μm), said phosphorus content and iron particle size distribution being such that on sintering said composition provides components of satisfactory mechanical strength and having soft magnetic properties about as good as or better than the soft magnetic properties of components made of solid iron of comparable purity.

4,190,442
FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,729
Int. Cl.[2] B22F *1/00*
U.S. Cl. 75—252 **8 Claims**

1. A flame spray powder mixture formed of agglomerates of an oxidizable metal separately mixed with a coating metal powder,

the average size of said agglomerates and said coating metal powder ranging from about 20 to 140 microns,

said agglomerates being made up of fine particles of said oxidizable metal of average size less than about 20 microns bound together in a matrix of a fugitive binder,

said oxidizable metal being characterized by a negative free energy of formation of the oxide of at least 30,000 calories per gram atom of oxygen referred to 25° C. and a melting point above 350° C.,

the composition of said powder mixture ranging from about 2% to 15% by weight of said oxidizable metal, with substantially the balance said coating metal powder.

4,190,443
FLAME SPRAY POWDER MIX

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Continuation-in-part of Ser. No. 915,938, Jun. 15, 1978. This application Dec. 11, 1978, Ser. No. 967,919
Int. Cl.[2] B22F 1/00
U.S. Cl. 75—252 6 Claims

1. A flame spray powder mixture formed of agglomerates of a metal disilicide and silicon combined together, with said agglomerates mixed with a coating metal powder,

said metal disilicide (MSi_2) and silicon when thermally fused together providing a eutectic phase of the binary MSi_2-Si,

said metal disilicide being at least one selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Re, Mn, and Co, said agglomerates being made of fine particles of said metal disilicide and silicon of average size less than about 20 microns bound together in a matrix of a fugitive binder,

the average size of said agglomerates and said coating metal powder ranging from about 30 to 140 microns,

the composition of said powder mixture ranging from about 2% to 15% by weight of said metal disilicide and sufficient silicon in the range of about 2% to 15% by weight to provide a eutectic phase of said binary MSi_2-Si, with substantially the balance of said flame spray powder mixture being said coating metal powder.

4,190,444
CONTINUOUS CASTING MOLD FLUX POWERS

George F. Carini, Penn Hills, Pa., assignor to The Clay Harden Company, Pittsburgh, Pa.

Filed Feb. 1, 1978, Ser. No. 874,024
Int. Cl.[2] C22B 9/10; B22D 11/00
U.S. Cl. 75—257 7 Claims

1. In the continuous casting of steel wherein the steel is teemed from a tundish to a continuous casting mold, the improvement comprising introducing to said mold during teeming, a mold flux powder, consisting essentially of, in weight percent, at least three sequentially melting systems,

the first system comprising 10 to 20 percent of one or more glasses having softening point temperatures between 1200° and 2000° F.,

the second system comprising 10 to 20 percent cryolite, optionally mixed with fluorspar in a ratio up to 1, and

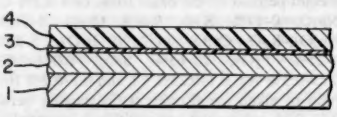
the third system comprising 60 to 80 percent of a mixture of flyash and whiting, the weight ratio of flyash to whiting in the mold flux powder being in the range 0.5 to 2,

whereby the fusion point, rate of fusion and fluidity can be tailored to the particular continuous casting process involved.

4,190,445
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEDIA AND PROCESS FOR MANUFACTURING THEREOF

Teruomi Takahashi, Yokohama, and Takehiko Matsuo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 666,778, Mar. 15, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 840,019
Claims priority, application Japan, Mar. 20, 1975, 50-33775
Int. Cl.[2] G03G 13/00, 5/04, 5/08
U.S. Cl. 430—66 14 Claims



1. An electrophotographic photosensitive member which comprises a photoconductive layer composed of a photoconductor dispersed in an insulating organic polymer binder, a clearcoling layer having a thickness of from 0.5 to 10 microns on said photoconductive layer, said clearcoling layer consisting essentially of a water-insoluble organic polymer containing carboxylic acid or sulfonic acid groups and which is water-insoluble when said acid groups are in the acid form and water-dispersible or water-soluble when said acid groups are neutralized with a base, and a smooth-surfaced electrically-insulating layer capable of retaining an electrostatic charge form on said clearcoling layer, said acid groups being not more than five moles per one kilogram of the polymer.

4,190,446
PHOTOCROSSLINKABLE, HIGH-TEMPERATURE-RESISTANT POLYMERS AND THEIR USE IN COLOR IMAGING DEVICES

Thomas W. Martin, Rochester; Mohammad A. Sandhu, Pittsford, and Dennis J. Savage, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1978, Ser. No. 940,057
Int. Cl.[2] G03C 5/00, 1/68; G03F 5/00
U.S. Cl. 430—25 6 Claims

1. A method of producing a color imaging device, said device comprising:

(a) a semiconductive wafer having a surface comprising:

(i) an array of charge-handling semiconductive photosensors and

(ii) bonding pad areas and

(b) a layer of a polymer superimposed with said surface, wherein said polymer layer:

(i) contains a planar array of filter elements in microregistration with said array of photosensors, wherein each of said elements contains a heat-transferable dye and

(ii) has window areas which correspond with said bonding pad areas, said method comprising the steps of:

(1) coating said surface with a layer of a polymer which is a photocrosslinkable organic solvent-soluble condensation polymer having at least two recurring units and a Tg greater than 200° C., wherein said polymer contains sufficient ethylenically unsaturated, cross-linkable units to render said polymer insoluble in organic solvents on exposure to radiation to which said crosslinkable units are sensitive,

(2) exposing said polymer layer to a pattern of radiation which represents the negative of said bonding pad areas so as to crosslink said polymer layer except in areas corresponding to said bonding pad areas,

(3) contacting said polymer layer with an organic solvent so as to remove said polymer layer in areas corresponding to said bonding pad areas, and

(4) transferring dye into said polymer layer so as to form filter elements in microregistration with said photosensors.

4,190,447
COVER SHEETS FOR INTEGRAL IMAGING RECEIVER ELEMENTS

Michael K. Coil, Fairport, and Robert A. Sylvester, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 867,845, Jan. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 789,060, Apr. 20, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,403
Int. Cl.[2] G03C 5/54, 1/40, 1/76
U.S. Cl. 430—214 18 Claims

1. In a photographic film unit comprising:

(a) an integral imaging receiver element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image providing material and a dye image receiving layer

containing a dye mordant; and having adjacent to said intergral imaging receiver element;

(b) a cover sheet comprising, in order, starting with the layer adjacent to said integral imaging receiver element, a barrier timing layer, a neutralizing layer for neutralizing an alkaline processing composition and a support; and

(c) an aqueous alkaline processing composition and means for discharging same between said integral imaging receiver element and said cover sheet;

the improvement comprising an alkali permeable hydrophilic layer which is substantially free of dye mordant coated over said barrier timing layer on said cover sheet so as to be between said barrier timing layer and said integral imaging receiver element.

5. The photographic film unit of claim 1 wherein said alkali permeable hydrophilic layer is the outermost layer of said cover sheet and wherein said alkali-permeable hydrophilic layer further comprises a matting agent.

4,190,448

DIFFUSION TRANSFER PHOTOGRAPHIC MATERIAL HAVING A CROSSLINKED CARBOXYLIC ACID POLYMER LAYER

Hidefumi Sera, and Ikutaro Horie, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Filed Oct. 5, 1978, Ser. No. 948,726
Claims priority, application Japan, Oct. 5, 1977, 52-119640
Int. Cl.[2] G03C *1/40, 1/48, 5/54*
U.S. Cl. 430—216 24 Claims

1. An element for a diffusion transfer photographic light-sensitive material comprising a synthetic resin film support having thereon an image-receiving layer, a light-sensitive silver halide emulsion layer and a layer of a carboxylic acid polymer wherein the carboxylic acid polymer is cross-linked with a polyhydric alcohol in the presence of a condensation-type cross-linking agent where the amount of said condensation type cross-linking agent is about 0.5 millimol or more per mol of carboxyl groups in the carboxylic acid polymer, with the proviso that the layer of the carboxylic acid polymer is positioned other than between the image-receiving layer and the light-sensitive silver halide emulsion layer.

4,190,449

ANTIADHESIVE PHOTOGRAPHIC MATERIALS AND METHOD OF IMPROVING ANTIADHESIVE PROPERTY OF PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Takashi Naoi, and Ikutaro Horie, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Filed Mar. 24, 1978, Ser. No. 889,799
Claims priority, application Japan, Apr. 5, 1977, 52/39134
Int. Cl.[2] G03C *1/78, 1/96, 1/76, 3/00*
U.S. Cl. 430—539 5 Claims

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer and an outermost layer thereof containing gelatin and colloidal silica prepared by adding potassium hydroxide to an aqueous dispersion of colloidal silica, said aqueous dispersion being a dispersion of microparticles of silicic anhydride having an average particle size of about 7 to 120 mμ and said colloidal silica present in said aqueous dispersion having an SiO_2/Na_2O ratio of about 350 to about 1,200 and wherein the amount of said potassium hydroxide added is such that the colloidal silica has an SiO_2/K_2O ratio of about 50 to about 1,500.

4,190,450

CERAMIC CORES FOR MANUFACTURING HOLLOW METAL CASTINGS

Ronald R. Robb, Dover; Charles Yaker, Summit, and Lamar Burd, Andover, all of N.J., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Nov. 17, 1976, Ser. No. 742,593
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.9 2 Claims

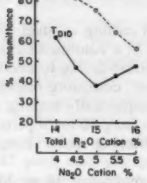
1. A ceramic core for use in the casting of hollow metal parts at temperature a in excess of 2000° F. consisting essentially of fused silica in an amount of at least 50% by weight of the core, Cristobalite in an amount within the range of 2.5–35% by weight and the remainder a ceramic material selected from the group consisting of zircon and alumina.

4,190,451

PHOTOCHROMIC GLASS

George B. Hares; David L. Morse; Thomas P. Seward, III, and Dennis W. Smith, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 887,677, Mar. 17, 1978, abandoned. This application Feb. 28, 1979, Ser. No. 14,981
Int. Cl.[2] C03C *3/08, 3/26;* G02C *7/10*
U.S. Cl. 106—47 Q 8 Claims



1. A transparent photochromic glass which, in bodies of 2 mm cross section, will exhibit the following properties:

(a) at about 20° C. will darken to a luminous transmittance below 40% in the presence of actinic radiation; will fade at least 30 percentage units of transmittance after five minutes' removal from the actinic radiation; and will fade to a luminous transmittance in excess of 80% in no more than two hours after being removed from the actinic radiation;

(b) at about 40° C. will darken to a luminous transmittance below 55% in the presence of actinic radiation; will fade at least 25 percentage units of transmittance after five minutes' removal from the actinic radiation; and will fade to a luminous transmittance in excess of 80% in no more than two hours after being removed from the actinic radiation; and

(c) at about −18° C. will not darken to a luminous transmittance below 15% in the presence of actinic radiation;

said glass having a base composition consisting essentially, in weight percent on the oxide basis, of 0–2.5% Li_2O, 0–9% Na_2O, 0–17% K_2O, 0–6% Cs_2O, 8–20% $Li_2O+Na_2O+K_2O+Cs_2O$, 14–23% B_2O_3, 5–25% Al_2O_3, 0–25% P_2O_5, 20–65% SiO_2, 0.004–0.02% CuO, 0.15–0.3% Ag, 0.1–0.25% Cl, and 0.1–0.2% Br, the molar ratio of alkali metal oxide:B_2O_3 ranging between about 0.55–0.85, where the composition is essentially free from divalent metal oxides other than CuO, and the weight ratio Ag:(Cl+Br) ranges about 0.65–0.95.

4,190,452

NEUTRAL BRONZE GLAZINGS

Klaus Fischer, Porz, Fed. Rep. of Germany, and Robert Keul, Cormeilles-en-Parisis, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 637,016, Dec. 2, 1975, Pat. No. 4,101,705.
This application Feb. 14, 1978, Ser. No. 877,743
Claims priority, application France, Dec. 3, 1974, 74 39459
Int. Cl.[2] C03C *3/04, 3/08, 3/30*
U.S. Cl. 106—52 2 Claims

1. A neutral bronze glass consisting essentially of the following ingredients in percentage by weight:

SiO_2: 60 to 75%
B_2O_3: 0 to 7%
Al_2O_3: 0 to 5%
Na_2O: 10 to 20%
K_2O: 0 to 10%
CaO: 0 to 16%
MgO: 0 to 10%
Fe_2O_3: 0.20 to 0.5%
CoO: 0.0025 to 0%
Se: 0.0025 to 0.0005%

said glass having at a thickness of 3 mm over the range of wavelengths from 400 to 750 nm a luminous transmittance above 70%, an excitation purity between 2% and 6%, a monochromatic transmittance to which the best straight line fit has at 400 nm a value between 5% and 15% lower than its value at 750 nm, and a dominant wavelength between 570–580 nanometers.

4,190,453

CASTING AND MOULDING COMPOSITIONS

Donald N. Hunter, and Lesley J. Wyatt, both of Bognor Regis, England, assignors to Rosemount Engineering Company Limited, England

Filed Apr. 13, 1978, Ser. No. 895,911
Claims priority, application United Kingdom, Apr. 18, 1977, 16035/77
Int. Cl.[2] C04B *19/00*
U.S. Cl. 106—85 2 Claims

1. A process for preparing a water free heatsettable casting or moulding composition which process comprises forming a mixture of alumina and a polyvalent metal polyphosphate by precipitating said polyvalent metal polyphosphate from an aqueous solution of an alkali metal polyphosphate in the presence of said alumina by the addition of a water-soluble polyvalent metal salt to said solution, thereafter separating said alumina and said polyvalent metal polyphosphate together from said solution, and drying the mixture of polyvalent metal polyphosphate and alumina.

4,190,454

CEMENT RETARDER AND RAPID HARDENING CEMENT CONTAINING THE SAME

Hirosi Yamagisi; Shozo Sakamaki; Koji Nakagawa, and Minoru Sirasawa, all of Oumi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 919,163
Claims priority, application Japan, Oct. 20, 1977, 52-126334
Int. Cl.[2] C04B *7/35*
U.S. Cl. 106—90 11 Claims

1. A rapid hardening cement comprising a cement rapid hardening agent, a cement and a cement retarder and/or water, said cement rapid hardening agent comprising an amorphous calcium aluminate and an inorganic sulfate in an amount of 1 to 3 times by weight as that of said amorphous calcium aluminate, the chemical composition of said amorphous calcium aluminate consisting essentially of 35 to 47% by weight of calcium oxide based on the weight of said amorphous calcium aluminate and the balance of aluminum oxide, said cement retarder comprising 5 to 20% by weight, based on the weight of said retarder, of gluconic acid and/or tartaric acid and/or a water soluble salt thereof, 30 to 10% by weight, based on the weight of said retarder, of citric acid and/or an alkali salt thereof, and 50 to 85% by weight, based on the weight of said retarder, of an alkali carbonate, and said water being added in an amount of 2% or less by weight based on the weight of said cement rapid hardening agent.

4,190,455

PROCESS FOR THE MANUFACTURE OF SHAPED PRODUCTS FROM CALCIUM SULPHATE DIHYDRATE

Jan M. J. M. Bijen, and Peter A. M. Kleinjans, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 900,136, Apr. 26, 1978, abandoned, which is a continuation of Ser. No. 794,928, May 9, 1977, abandoned. This application May 4, 1978, Ser. No. 902,694
Claims priority, application Netherlands, May 8, 1976, 7604948
Int. Cl.[2] C04B *7/02, 11/12*
U.S. Cl. 106—98 14 Claims

1. A method for the controlled manufacture of shaped products comprising the steps of forming a mixture of $CaSO_4.2H_2O$, a particulate inorganic material, cement and water and compressing said mixture to form shaped products, wherein said mixture contains hydraulic cement in an amount of between about 8 and 15 percent by weight of the combined dry weight of said $CaSO_4.2H_2O$ and particulate inorganic silicious material, and from about 5 to 50 percent by weight water, and wherein said manufacture is controlled to obtain shaped products having a crushing strength within about 10 percent of the predetermined crushing strength D by selecting S and P in accordance with the formula:

$$D=2.6\times10^3(100-S)^{-1.2}\times P^{0.43}$$

wherein:

D is the predetermined crushing strength in kg/cm^2;
P is the pressure in kg/cm^2 applied to said mixture in forming said shaped article; and
S is the amount of said particulate inorganic silicious material in said mixture expressed as a percent by weight of the dry weight of $CaSO_4.2H_2O$ and particulate inorganic silicious material present in said mixture and wherein S is between about 20 to 70 percent by weight and P is between about 50 and 500 kg/cm^2.

4,190,456

CEMENTITIOUS COMPOSITION CONTAINING ASBESTOS FIBRES AND PREPARED USING A SURFACTANT

Victor J. Absolon, Plaisir, France; George T. Hurst, Newport, Australia; John C. Worboys, Doncaster, Australia; George H. Barnett, North Balwyn, Australia, and Ross P. Dickson, Oakleigh, Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Jun. 27, 1978, Ser. No. 919,548
Claims priority, application Australia, Jul. 1, 1977, 0679/77; Jul. 1, 1977, 0680/77; Jul. 1, 1977, 0681/77
Int. Cl.[2] C04B *31/08*
U.S. Cl. 106—99 37 Claims

1. Cementitious compositions containing hydraulic cement and novel asbestos fibres characterized in that the said asbestos fibres have surfactant thereon and are derived from asbestos-bearing material by a process which comprises firstly treating said asbestos-bearing material with a surfactant adsorbable on or reactable with said asbestos fibre to form a dispersion and secondly agglomerating said dispersion.

4,190,457

PREPARATION OF INORGANIC XEROGELS

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jun. 9, 1978, Ser. No. 914,258
Int. Cl.[2] C01B *33/16*
U.S. Cl. 106—122 31 Claims

1. A process for preparing an inorganic xerogel which comprises contacting an inorganic hydrogel with a contacting system which comprises at least one organosilicon compound of the formula

$$R_nSiA_{4-n}$$

wherein n is an integer of 2 or 3, wherein each R is a saturated or unsaturated hydrocarbon group and each R can be the same or different and wherein A is selected from the group consisting of hydroxy radicals, halides, and alkoxy radicals in which the alkyl group therein contains from 1 to about 10 carbon atoms; and,

heating the thus contacted inorganic hydrogel at an elevated temperature such that essentially all the liquid components contained therein are removed, wherein the amount of the at least one organosilicon compound employed in the contacting step is an amount sufficient to provide an increase in pore volume of the contacted and heated inorganic hydrogel as compared to the pore volume of the heated inorganic hydrogel not contacted with the organosilicon compound.

4,190,458

METAL-SILICA SOLUTION FOR FORMING FILMS ON SEMICONDUCTOR SURFACES

Raymond DiBugnara, Huntington Beach, Calif., assignor to TRW Inc., Los Angeles, Calif.

Division of Ser. No. 741,793, Nov. 15, 1976, Pat. No. 4,126,713. This application Mar. 27, 1978, Ser. No. 890,810
Int. Cl.[2] C09K *3/00*
U.S. Cl. 106—287.16 5 Claims

1. A partially cross-linked metal chloro-silicate solution for coating semicondutor devices and the like produced by the steps of:

(a) forming a mixture of:

(i) a first alcohol solution of a platinum chloride and a chloride-ion producing cross-linking agent for tetraethylorthosilicate, and

(ii) a second alcohol solution of tetraethylorthosilicate; and

(b) aging said mixture a predetermined length of time so as to form a partially cross-linked tetraethylorthosilicate composition.

4,190,459

PROCESS FOR THE PRODUCTION OF MINERAL FIBER MATS

Rainer Welte, Leverkusen, Fed. Rep. of Germany; Peter Markusch, New Martinsville, W. Va.; Dieter Dieterich, Leverkusen, and Werner Dietrich, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,766
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2728074
Int. Cl.[2] C04B *31/08, 31/42;* C09K *3/00*
U.S. Cl. 106—287.25 6 Claims

1. A process for the production of mineral fiber mats by bonding mineral fibers with binders, wherein an emulsion of water glass and isocyanate which has been prepared in a preceding mixer is used as binder.

4,190,460

SULFUR PLASTICIZATION WITH OLEFINS

Richard D. Cassar, West Chester, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Filed Apr. 3, 1978, Ser. No. 892,815
Int. Cl.[2] C09K *3/00*
U.S. Cl. 106—287.32 14 Claims

1. A process for plasticizing sulfur to obtain a flexible, elastomeric material which consists essentially of adding to sulfur with thorough mixing at a temperature of from about 115° to about 160° C. from about 10% to about 50% by weight of said sulfur a mixture of dicyclopentadiene and an olefinic material selected from the group of (1) an unsaturated bridge-ring hydrocarbon containing at least two double bonds, (2) a cyclic or acyclic di- or triolefinic terpene, and (3) a hydrocarbon where a cyclic diene is fused to an aromatic ring, wherein said bridge-ring hydrocarbon is selected from the group consisting of:

(a) unsaturated derivatives of bicyclo[2.2.1]heptane, containing at least two double bonds,

(b) unsaturated derivatives of bicyclo[2.2.2]octane containing at least two double bonds,

(c) unsaturated derivatives of bicyclo[3.2.1.]octane containing at least two double bonds,

(d) unsaturated derivatives of bicyclo[3.3.1]nonane containing at least two double bonds, and

(e) unsaturated derivatives of bicyclo[3.2.2]nonane containing at least two double bonds;

wherein said cyclic or acyclic di- or triolefin terpene is selected from the group consisting of: dipentene, ψ-limonene, 3,8-p-menthadiene, α- and β-phellandiene, α- and γ-terpinene, terpinolene, isoterpinolene, myrcene, ocimene, alloocimene, p-cymene, α- and β-caryophyllene,

wherein said hydrocarbon with a cyclic diene fused to an aromatic ring is selected from the group consisting of indene, acenaphthalene and azulene, and wherein the weight ratio of said dicyclopentadiene to said olefinic material is from about 25:75 to about 75:25.

4,190,461

METHOD FOR REMOVING METALLIC SEEDS FROM NYLON TUBING USED IN INTERSTITIAL BRACHYTHERAPY

Bruce W. Hedger, Burbank, Calif., assignor to Alpha-Omega Services, Inc., Paramount, Calif.

Filed Mar. 20, 1978, Ser. No. 890,572
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—1 7 Claims

1. A method for recovering metallic seeds embedded in nylon which comprises the steps:

a. adding nylon with radioactive metallic seeds embedded therein to a solvent in which nylon dissolves to form a mixture comprising dissolved and undissolved nylon, solvent, and metallic seeds; and

b. subjecting the mixture to ultrasonic waves to substantially completely dissolve the nylon in the solvent, thus freeing up the metallic seeds.

4,190,462

DISSOLVING BARIUM SULFATE SCALE WITH AQUEOUS SOLUTIONS OF SALTS OF CARBOXYMETHYL MONOCYCLIC MACROCYCLIC POLYAMINES

Reike De Jong; Gerridina J. Torny-Schutte, and David N. Reinhoudt, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 15, 1979, Ser. No. 3,155
Claims priority, application United Kingdom, Jul. 4, 1978, 28757/78
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—2 5 Claims

1. A process for removing barium sulfate scale from fluid-

contactable surfaces in a location into which fluid can be flowed which comprises;

flowing into contact with said surfaces an aqueous solution consisting essentially of water, an effective complexing amount of a monovalent cation salt of a monocyclic macrocyclic polyamine containing at least two nitrogen-linked carboxymethyl groups and enough dissolved monovalent basic compound to provide a solution pH of at least about 8;

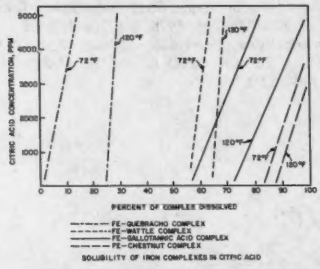
said polyamine having an intra-molecular cavity or crypt which is selectively receitive to multivalent cations; and,

said aqueous solution being both capable of relatively rapidly and extensively dissolving solid barium sulfate and free of any bicyclic macrocyclic polyether.

4,190,463
METHOD OF REMOVING IRON OXIDE DEPOSITS FROM HEAT TRANSFER SURFACES

Roy I. Kaplan, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 5, 1979, Ser. No. 9,563
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—3 **6 Claims**



SOLUBILITY OF IRON COMPLEXES IN CITRIC ACID

1. A method for removing iron oxide deposits from heat transfer surfaces which comprises the sequential stepsl

(a) contacting such surfaces with an aqueous solution which contains at least 25 parts per million of a hydrolyzable tanning extract and has a pH of not more than 8.5 for a period of time sufficient to complex with a substantial portion of the iron oxide deposits; and then

(b) removing the complexe ' 'eposits formed in step (a) with an aqueous solution having a pH not greater than 4 which contains at least 1000 parts per million of citric acid.

4,190,464
METHOD FOR CLEANING A PHOTOCONDUCTIVE SURFACE WITH LIQUID TONER

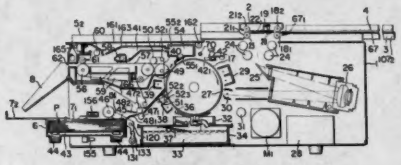
Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 588,228, Jun. 19, 1975, abandoned, which is a division of Ser. No. 583,247, Jun. 3, 1975, Pat. No. 4,009,955, which is a continuation of Ser. No. 461,104, Apr. 15, 1974, abandoned, which is a continuation of Ser. No. 258,820, Jun. 1, 1972, Pat. No. 3,804,512. This application Dec. 14, 1977, Ser. No. 860,457

Claims priority, application Japan, Jun. 3, 1971, 46-38917; Jun. 3, 1971, 46-38918; Jun. 9, 1971, 46-48632[U]; Jun. 10, 1971, 46-41195; Jun. 10, 1971, 46-41196; Jun. 10, 1971, 46-41197; Jun. 21, 1971, 46-44611; Aug. 30, 1971, 46-6674

Int. Cl.[2] B08B *3/12, 6/00;* G03G *21/00;* B08B *7/00*
U.S. Cl. 134—6 **29 Claims**

1. A method of operating an electrophotographic machine including a rotatable medium, electrostatic latent image means for forming an electrostatic latent image on said rotatable medium, liquid developer means for applying liquid developer to the electrostatic latent image to form a toner image thereof on said medium, transfer means for transferring the toner image from said rotatable medium to transfer material, cleaning means, including a cleaning blade, contacting said rotatable medium for cleaning same for repetitive use, and means for supplying cleaning liquid to the contact area between said cleaning means and said rotatable medium, said electrostatic latent image means, liquid developer means, transfer means and cleaning means being disposed sequentially along the path of movement of said rotatable medium in the direction of rotation, said method comprising:



(a) supplying, once said machine starts to operate, cleaning liquid onto said contact area for a predetermined period of time while said rotatable medium is maintained in a fixed position; then

(b) rotating said rotatable medium through a predetermined angle while said cleaning means is being operated for wet-cleaning, wherein said angle corresponds to at least one half of a full rotation; and then

(c) enabling said machine to carry out an image-forming operation.

4,190,465
LUMINESCENT SOLAR COLLECTOR STRUCTURE

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

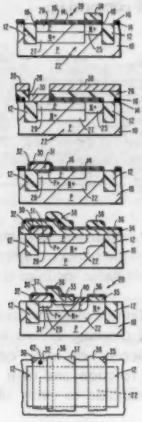
Filed Nov. 13, 1978, Ser. No. 959,964
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 FC **12 Claims**

1. A luminescent solar collector having at least two light conducting layers, each layer being physically and optically coupled to the next adjacent layer, one of said at least two layers (1) being relatively thick compared to each of the other of the other said layers and (2) having at least one photocell optically and physically coupled on a minor portion of one of the extended face surfaces thereof, and the other of said at least two layers being luminescent, said relatively thick layer having the highest refractive index of any layer in said collector, said photocell-coupled layer optionally containing a luminescent species which if present has an emission that is absorbed by and activates another luminescent species in another of the layers of said collector, each of the layers of said collector other than the photocell-coupled layer having an index of refraction at least 0.04 less than said relatively thick layer, said relatively thick layer being at least ten (10) times as thick as the sum of all other layers of said luminescent solar collector.

4,190,466
METHOD FOR MAKING A BIPOLAR TRANSISTOR STRUCTURE UTILIZING SELF-PASSIVATING DIFFUSION SOURCES

Arup Bhattacharyya, Essex Center, and Francis W. Wiedman, III, Stowe, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,182
Int. Cl.[2] H01L *21/265, 21/225, 21/31*
U.S. Cl. 148—1.5 28 Claims



1. A method of making a transistor structure in a semiconductor substrate of a given conductivity type having a major surface comprising the steps of:

isolating a region of said semiconductor substrate at said major surface,

forming a collector region of a conductivity type opposite to that of said given conductivity type below and spaced from said major surface so as to define a base region between said collector region and said major surface,

applying a first self-passivating conductive layer to a first portion of said major surface,

passing impurities of said given conductivity type to said first portion of said major surface through said first self-passivating conductive layer to form a contact region in said base region,

forming an insulating layer on the outer surface of said self-passivating conductive layer,

applying a second conductive layer to said insulating layer and to a second portion of said major surface adjacent to said first surface portion, and

passing impurities of said opposite conductivity type through said second conductive layer to said second surface portion adjacent said first surface portion to form within said base region an emitter region spaced within the thickness of said insulating layer from said first surface portion.

4,190,467
SEMICONDUCTOR DEVICE PRODUCTION

Suei-Yuen P. Lien, West Windsor Township; Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 970,031
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—1.5 5 Claims

1. A method of processing a semiconductor wafer by thermal gradient zone melting, comprising:

selecting a suitable semiconductor wafer to be processed,

depositing a metal suitable for thermal migration through said semiconductor wafer in a desired pattern on a first surface of said wafer,

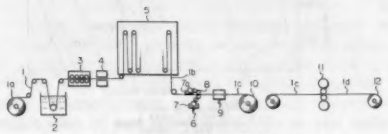
said metal pattern including a layer of metal around the periphery of said first surface of said wafer adjacent the edge of said wafer, and

heating the wafer so as to cause the metal of said pattern to melt and to cause the thermal gradient migration through said semiconductor wafer in the directon of the second surface of said wafer.

4,190,468
PROCESS FOR COATING AN ELECTRICAL STEEL SHEET WITH AN ANTI-STICKING LAYER

Minoru Kitayama, and Motoharu Nakamura, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 932,508
Claims priority, application Japan, Aug. 15, 1977, 52-97632
Int. Cl.[2] C21D *1/18, 1/26, 1/78*
U.S. Cl. 148—12 A 5 Claims



1. A process for producing an electrical steel sheet coated with an anti-sticking layer, comprising the steps of:

continuously annealing an electrical steel sheet;

applying, onto at least one surface of said annealed sheet, a coating liquid which consists essentially of at least one colloidal inorganic substance selected from the group consisting of colloidal silica, alumina sol, colloidal titanium oxide, colloidal lithium silicate and colloidal artificial mica, and which is in an amount sufficient enough for forming a dry anti-sticking layer having a weight of 0.02 to 0.8 g per m^2 of said surface, while said annealed sheet is kept at a temperature of from 50° to 150° C.;

drying said applied coating liquid on said surface by utilizing the heat remaining in said annealed sheet, and

temper-rolling said dried sheet at a reduction of 0.2 to 10 percent.

4,190,469
METHOD FOR FORMING FORSTERITE INSULATING FILM ON AN ORIENTED SILICON STEEL SHEET

Toshio Ichida; Michiro Komatsubara, both of Chiba, and Hiroshi Shimanaka, Funabashi, all of Japan, assignors to Kawasaki Steel Corporation, Tokyo, Japan

Filed Nov. 2, 1978, Ser. No. 956,912
Claims priority, application Japan, Nov. 9, 1977, 52-133543
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 3 Claims

1. In a method for forming forsterite insulating film having a high adhesion on an oriented silicon steel sheet, wherein a water slurry containing an annealing separator consisting essentially of magnesia and a CaO impurity, is applied on surfaces of an oriented silicon steel sheet, and then the silicon steel applied with said water slurry is dried, the coated silicon steel

sheet is wound up into a coil and annealed at high temperatures to form forsterite films, the improvement comprising adjusting the content (Xg/l m^2 of both surfaces of the steel sheet) of water carried together with the annealing separator into the coil depending upon the content (Yg/l m^2 of both surfaces of the steel sheet) of CaO carried into the coil so as to satisfy the following formula

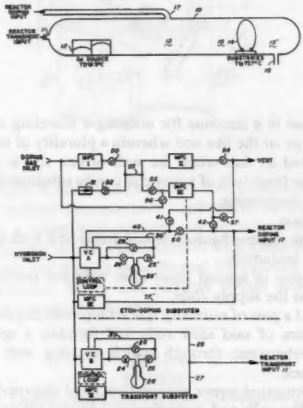
$$(1.25X)^2+(10Y)^2 \leqq 1.$$

4,190,470

PRODUCTION OF EPITAXIAL LAYERS BY VAPOR DEPOSITION UTILIZING DYNAMICALLY ADJUSTED FLOW RATES AND GAS PHASE CONCENTRATIONS

Robert E. Walline, Bedford, Mass., assignor to M/A COM, Inc., Burlington, Mass.

Filed Nov. 6, 1978, Ser. No. 958,207
Int. Cl.[2] H01L *21/205, 21/66*
U.S. Cl. 148—175 **28 Claims**



1. A method of producing an epitaxial layer of a compound comprising a first material selected from the group consisting of boron, aluminum, gallium, indium and mixtures thereof and a second material selected from the group consisting of phosphorus, arsenic, antimony and mixtures thereof, said method comprising,

passing a carrier gas flow through a liquid halide of said second material to obtain a first vapor containing a halogen, carrier gas and second material as a raw reactor input vapor, while monitoring said carrier gas flow and adjusting it to obtain a predetermined mass of halogen and second material in said raw vapor,

and forming a final reactor input vapor while maintaining a constant flow rate of said final vapor at a constant concentration of second material by monitoring the total volume of carrier gas in said raw vapor as added per unit of time and adjusting said raw vapor by adding a volume of additional carrier gas to form said final vapor,

passing said final vapor to a source of said first material in a reactor where a reaction takes place, passing the products of said reaction to a seed crystal and depositing said epitaxial layer on said seed crystal.

4,190,471

PYROTECHNIC DISSEMINATING FORMULATIONS

James P. Flynn, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1969, Ser. No. 853,609
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.6 **6 Claims**

1. A composition comprising by weight:

(a) from about 40 to about 60% of a psychotomimetic agent,

(b) from about 15 to about 40% of a nitrate, chlorate or perchlorate oxidizer, and

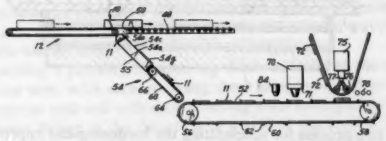
(c) from about 15 to about 40% of a cross-linked organic polymeric binder comprising an aliphatic sulfur-containing organic compound having a plurality of mercapto groups (—SH) in the molecule, and a curing agent selected from the group of trifunctional tris[2(1-aziridinyl)ethyl]benzene tricarboxylates or an aliphatic sulfur-containing epoxy resin having a functionality of at least about 1.5, said binder comprising sufficient quantities of the components thereof so that the ratio of mercapto group equivalents to reactive group equivalents of the curing agent is from about 0.6 to about 1.4.

4,190,472

AUTOMATED SYSTEM FOR THE APPLICATION OF COVERGLASSES ON HISTOLOGICAL AND CYTOLOGICAL SLIDES

Alex Slonicki, 86 Bacon St., Winchester, Mass. 01890

Filed Sep. 28, 1977, Ser. No. 837,642
Int. Cl.[2] A65C *9/08*; A01N *1/00*
U.S. Cl. 156—57 **9 Claims**



1. A process for finishing stained glass slides comprising the steps of: inserting stained slides into pivotable slide holders elements in a rack, moving said rack over an opening in a rack support and discharging a respective inserted stained slide from said rack through an opening in the bottom of said rack by pivoting said slide holder elements, said slide holder elements for said respective inserted slide overlying said rack support opening, said respective slide dropping onto a conveying means; repeating said steps of moving said rack and discharging a respective slide; transporting said slides on said conveying means in a direction away from said rack; depositing glue onto said slides while on said conveying means after being transported away from said rack; and applying a cover glass to each of said slides while on said conveying means so that each cover glass adheres to each slide by means of said glue.

7. A system for processing and finishing stained glass slides comprising:

(a) a staining rack for receiving stained slides and including slide holder elements movable in unison from a first position inclined at a first angle from the vertical to a second position inclined at a second angle from the vertical and means for discharging the stained slides therefrom;

(b) conveying means for receiving the discharged stained slides from said staining rack, and for transporting the stained slides in a direction away from said staining rack said conveying means comprising:

a rack support formed with an opening, said staining rack being movable across said opening, said slide holder elements being in one of said first and second positions, the rack opening being sufficiently wide for a slide inserted into the staining rack slide holder elements to

drop therethrough; a first propelling means disposed below said rack; and

a second propelling means having an inclined position and being placeable in the vicinity of said rack and of said first propelling means, whereby the dropped slide lands on said second propelling means, and is pushed by the latter onto said first propelling means being movable at a predetermined velocity and

(c) a slide finishing station cooperating with said conveying means, said slide finishing station including means for depositing glue onto the stained slide, the stained slide carrying the glue, and means for applying a cover glass to the glue-carrying slide.

4,190,473

PROCESS FOR ACCELERATING THE HARDENING OF JOINTS GLUED WITH CRYSTALLINE HARDENING ADHESIVES

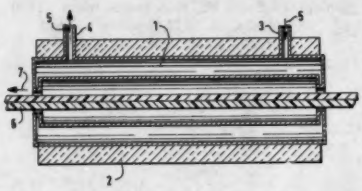
Erhard Soecknick, Düsseldorf, and Erich Weimar, Viersen, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,361

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659502

Int. Cl.² B29C *25/00*

U.S. Cl. 156—80 **4 Claims**



1. In a process for accelerating the hardening and improving the strength of joints glued with crystalline hardening adhesives, according to which the materials to be joined are coated with an adhesive and heated for the purpose of driving off the thinner and joined together, the improvement being rapidly cooling the freshly glued heated joint after the materials are heated and joined together by means of a low boiling liquified gas by passing the glued joint through the passageway of a tunnel having a heat exchange jacket with a chilling medium inlet and outlet therefore and feeding the low boiling liquified gas into the inlet for obtaining a temperature of −30° C. to −50° C. at the tunnel entrance, and obtaining a final adhesion upon the joint leaving the device in which it is shockwise cooled and rewarmed to ambient temperature with the shockwise cooling accelerating the crystalline hardening and thereby maximizing the strength of the joint in a minimal time.

4,190,474

METHOD OF MAKING A PRINTED CIRCUIT BOARD HAVING MUTUALLY ETCHABLE COPPER AND NICKEL LAYERS

Betty L. Berdan, and Betty M. Luce, both of Willowick, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 22, 1977, Ser. No. 863,109

Int. Cl.² C25D *1/00*

U.S. Cl. 156—151 **5 Claims**

1. A method of producing a readily etchable printed circuit board including a resinous substrate and a sheet of copper foil having a nickel barrier layer deposited on one surface thereof with the opposite surface of said nickel layer being bonded to said resinous substrate which comprises:

providing a sheet of copper foil,

depositing a layer of nickel on a surface of said sheet of copper foil in which said nickel layer contains an effective amount of sulfur to render said copper foil and said nickel barrier layer mutually etchable, and

bonding the exposed surface of said nickel barrier layer to said resinous substrate.

4,190,475

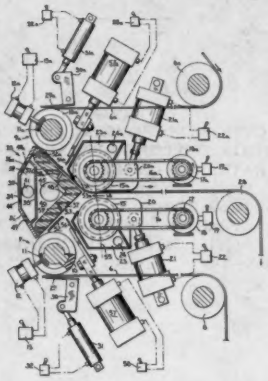
PAPER ROLL WEB SPLICING

Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed May 16, 1978, Ser. No. 906,592

Int. Cl.² B65H *19/08*

U.S. Cl. 156—157 **22 Claims**



1. For use in a machine for utilizing a traveling continuous web of paper or the like and wherein a plurality of supply rolls are provided so that when the web of one roll is nearly exhausted, the fresh web of a new roll can be substituted therefor, apparatus comprising:

(a) a frame,

(b) A splicing mechanism on said frame and with said mechanism including:

(1) a pair of spaced input idler rolls for receiving webs from the supply rolls,

(2) and a pair of normally spaced nip rolls disposed downstream of said idler rolls and forming a splicing nip therebetween through which running web normally passes,

(c) an elongated paper preparation head disposed between said idler rolls and extending rearwardly toward said nip rolls,

(d) first means associated with the front portion of said head for securely holding the leading end portion of a fresh web to the head for preparation by cut-off and application of adhesive to the outer face of the web edge portion,

(e) and second means associated with a rearwardly extending portion of said head for pressurizingly forcing a prepared fresh web being threaded along said rearwardly extending head portion away from the latter to prevent engagement by the adhesive on said web edge portion with said rearwardly extending head portion.

18. For use in a machine for utilizing a traveling continuous web of paper or the like and wherein a plurality of supply rolls are provided so that when the web of one roll is nearly exhausted, the fresh web of a new roll can be substituted therefor, apparatus comprising:

(a) a frame,

(b) a splicing mechanism on said frame and with said mechanism including:

(1) a pair of spaced input idler rolls for receiving webs from the supply rolls,

(2) and a pair of normally spaced nip rolls disposed downstream of said idler rolls and forming a splicing nip

therebetween through which running web normally passes,

(c) an elongated paper preparation head disposed between said idler rolls and extending rearwardly toward said nip rolls,

(d) a flexible clamping spring disposed adjacent each said input idler roll upstream from said head and adapted to clamp a running expiring web against its adjacent idler roll,

(e) a high friction surface on each said idler roll,

(f) and means to brake the said adjacent idler roll so that said expiring web is braked therewith to a stop.

4,190,476

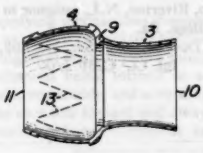
PROCESS OF FORMING A PROJECTILE BY FOLDING A RESILIENT TUBULAR MEMBER AND FILLING SAME WITH PAYLOAD

Abraham Flatau, 2003 Stockton Rd., Joppa, Md. 21085; Donald N. Olson, 38 Atherton Rd., Lutherville, Md. 21093, and Miles C. Miller, 504 Haverhill Rd., Joppa, Md. 21085

Division of Ser. No. 422,493, Dec. 6, 1973, Pat. No. 3,951,070, which is a continuation-in-part of Ser. No. 310,626, Nov. 29, 1972, Pat. No. 3,898,932. This application Jan. 12, 1976, Ser. No. 648,240

Int. Cl.² B29C *17/02*; F42B *13/12*

U.S. Cl. 156—218 **5 Claims**



1. A process of making a projectile comprising the steps of: forming a resilient structure into a substantial tubular annular shape with a outer wall portion and an inner wall portion located along the tubular extent thereof with a foldable portion therebetween and folding same thereat for defining a payload carrying portion; filling said payload within said carrying portion and closing the fill area.

4,190,477

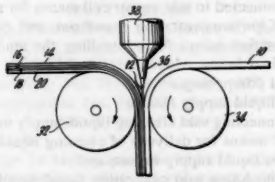
POUCH

William F. Ossian, Appleton; Thomas S. Wildenberg, Kimberly, both of Wis., and Henry Warmbier, New Hope, Minn., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 866,928, Jan. 4, 1978. This application May 1, 1978, Ser. No. 901,644

Int. Cl.² B29B *3/00*

U.S. Cl. 156—244.11 **5 Claims**



1. A method of making a multiply laminated structure comprising an inside sealing layer containing polypropylene and an outer metal foil layer, which method comprises:

(a) applying a primer layer to said metal foil, said primer layer being a graft copolymer of maleic anhydride and propylene wherein the maleic anhydride moieties are grafted onto a polypropylene backbone;

(b) drawing said primed metal foil laminate and said sealing layer in face-to-face relation into the nip defined by a pair of rollers; and

(c) simultaneously drawing a hot layer of extrusion grade polypropylene into said nip between said sealing layer and primer layer to thereby laminate said sealing layer to said primer layer.

4,190,478

PROCESS AND APPARATUS FOR PRODUCTION OF FACED OR LAMINATED SHEETS

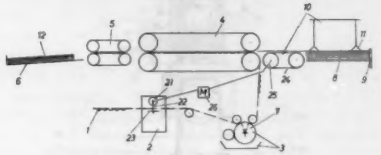
Ralf Meisenberg, Düren-Birkesdorf, Fed. Rep. of Germany, assignor to O. Dorries GmbH, Düren, Fed. Rep. of Germany

Filed Oct. 27, 1978, Ser. No. 955,642

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748675

Int. Cl.² B32B *31/00*

U.S. Cl. 156—252 **31 Claims**



1. A process for producing faced sheets, comprising the steps of:

providing an elongated carrier web having lines of perforations that extend transversely to the direction of travel of the carrier web;

mounting a plurality of covering sheets in series to the carrier web, with each covering sheet being mounted to the carrier web and with each covering sheet having a leading edge facing in the direction of travel of the carrier web and having a trailing edge facing in the opposite direction;

then tearing off a section of the carrier web along a line of perforations and with the respective covering sheet being on the torn off section of the carrier web; the covering sheets being so placed that at least one of the leading and trailing edges of each covering sheet projects beyond the adjacent line of perforations on the separated section of the carrier web.

4,190,479

METHOD OF PRODUCING A JOINT CAPABLE OF TRANSMITTING HIGH TORQUE

Derek R. Smith, Bristol, England, assignor to Union Carbide Corporation, New York, N.Y.

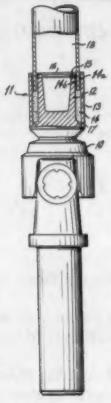
Continuation of Ser. No. 753,819, Dec. 23, 1976, abandoned. This application Oct. 24, 1978, Ser. No. 954,112

Int. Cl.² B32B *1/08, 1/02*

U.S. Cl. 156—294 **16 Claims**

1. A process for securely bonding a tubular shaft to an end fitting provided with a mating section having two concentric cylindrical walls which describe an annular cavity adapted to receive the tubular shaft therein to produce an assembly wherein the shaft and end fitting are in axial alignment and which is capable of transmitting high torque which comprises: (1) fitting an annular groove positioned near the top of the inner cylindrical wall of the mating section of the end fitting with a resilient sealing ring having an inner diameter such that it is retained in place by the groove and an outer diameter greater than that of the outer diameter of said inner cylindrical wall, said sealing ring being designed to fit snugly into the tubular shaft and form a tight fit between said inner cylindrical wall and the shaft; (2) filling the annular cavity between the

inner and outer cylindrical walls of the mating section of the end fitting with a suitable liquid bonding agent; (3) inserting one end of the tubular shaft into the annular cavity between the inner and outer cylindrical walls of the mating section of the end fitting so as to compress the resilient sealing ring at the top of the inner cylindrical wall snugly between said inner cylindrical wall and the inner circumference of the tubular shaft and effect a seal therebetween; (4) further inserting the tubular shaft into the annular cavity between the inner and outer cylindrical walls of the mating section of the end fitting, thereby displacing excess bonding agent present in the annular cavity and causing said excess bonding agent to flow out of said annular cavity via the space between the outer circumference of the tubular shaft and the inner circumference of the outer cylindrical wall of the mating section; (5) continuing to insert the tubular shaft into the annular cavity between the inner and



outer cylindrical walls of the mating section of the end fitting until said tubular shaft has been forced into place over an annular shoulder positioned near the base of the inner cylindrical wall, said annular shoulder having an outer diameter greater than that of the outer diameter of said inner cylindrical wall and being designed to fit snugly into the tubular shaft and form a tight fit between said inner cylindrical wall and the inner circumference of said tubular shaft; and (6) curing said bonding agent to the thermoset state so as to bond the shaft and the mating section of the end fitting together in axial alignment, there being present a spacing between the outer circumference of the shaft and the inner circumference of the outer cylindrical wall of the mating section of the end fitting as well as between the inner circumference of the shaft and the outer circumference of the inner cylindrical wall of the mating section of the end fitting.

4,190,480

SUPPORT FOR DEFORMABLE ARTICLES AND METHOD OF MAKING THE SAME

Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Continuation-in-part of Ser. No. 752,609, Dec. 20, 1976, Pat. No. 4,104,508. This application May 22, 1978, Ser. No. 908,208

Int. Cl.[2] B32B *3/02*

U.S. Cl. 156—296 **10 Claims**

1. The method of making a support carpet for supporting heat softening articles in a stream of heat, comprising the following steps in the sequence set forth:

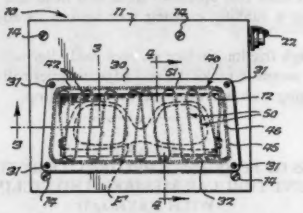
providing a woven tape having lengthwise warp strands and crosswise woof strands;

winding said tape on a form having a multiplicity of projecting pegs to form a zig zag course to provide alternate rows of said tape with alternate spaces between, with a first selvage edge projecting beyond the ends of said pegs and the second selvage edge at the base of said pegs;

impregnating said first edge with a bonding material;

allowing said bonding material to set;

removing said bonded tape from said form;



cutting said woof strands at the second selvage edge;

and stripping off several of said warp strands to leave said woof strands individually free, one from the other, at said second edge, while said woof strands and warp strands are bonded at said first selvage edge.

4,190,481

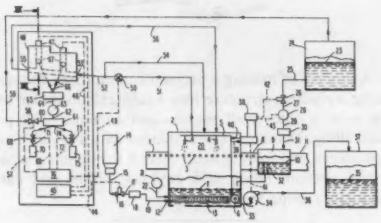
APPARATUS FOR ION CONTROL OF SOLUTIONS

Daniel L. Goffredo, Riverton, N.J., assignor to Chemcut Corporation, State College, Pa.

Filed Dec. 30, 1977, Ser. No. 865,859

Int. Cl.[2] C23F *1/00*

U.S. Cl. 156—345 **18 Claims**



1. In an apparatus for etching or otherwise chemically treating articles with treatment solution, wherein chamber means is provided for treating articles therein, wherein delivering means is provided for delivering treatment solution to articles in said chamber means, wherein detecting means of the sensor cell type is provided, connected to said delivering means for sampling treatment solution for detecting the ion concentration of the treatment solution, wherein compensation means are provided for adding an ion-corrective fluid to the treatment solution in said delivering means, and wherein regulator means are connected to said sensor cell means for receiving an indication of ion concentration therefrom, and connected to said compensation means for controlling the amount of ion-corrective fluid being added to said delivering means, the improvement comprising:

(a) cleaning liquid supply means;

(b) means connecting said cleaning liquid supply means to said sensor cell means for delivery of cleaning liquid thereto;

(c) calibration liquid supply means; and

(d) means connecting said calibration liquid supply means to said sensor cell means for delivery to said sensor cell means of a calibration solution of known ion concentration.

13. In an apparatus for etching or otherwise chemically treating articles with treatment solution, wherein treatment solution is periodically sampled in a sensor cell for detecting the ion concentration of the solution, the improvement com-

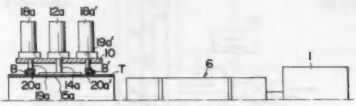
prising said sensor cell having an inlet and outlet for treatment fluid, a conduit in said cell interconnecting said inlet and outlet; at least two electrodes carried by said cell; each said electrode having a solution-contacting portion extending internally of said cell in communication with said conduit; and said cell being of substantially transparent construction.

4,190,482

TIRE BUILDING APPARATUS

Toshinori Yabe, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 9, 1978, Ser. No. 905,039
Claims priority, application Japan, May 13, 1977, 52/55875
Int. Cl.[2] B29H *17/22*
U.S. Cl. 156—403 **4 Claims**



1. A tire building apparatus comprising in combination:
a tire building drum, including:
a cylindrical tire building drum body form so as to be radially expansible and contractable and so as to be rotatable around a rotary axis thereof and having two axial ends, and
a pair of bead applying mechanisms disposed in close proximity of both axial ends of said tire building drum body to be rotatable together with said tire building drum body, and said mechanims being formed so as to be radially expansible and contractable; and a transfer ring, including:
an annular frame movable toward and away from a position where said annular frame surrounds said tire building drum,
a tire component carrying mechanism having a plurality of tire component carrying members radially movably mounted on said annular frame and being capable of carrying a tire component in concentrical relation with said rotary axis of said tire building drum body to mount said tire component on and around said tire building drum, and
a pair of bead carrying mechanisms mounted on said annular frame to be disposed at both axial ends of said tire component carrying mechanism in spaced relation with each other, each of said bead carrying mechanims having a plurality of bead carrying members which is made radially movable to carry beads in concentrical relation with said tire building drum body, said bead carrying mechanism being movable toward and away from a position in which said carrying mechanisms respectively surround said bead applying mechanisms and being capable of setting beads on said tire component in cooperation with said bead applying mechanism while said annular frame surrounds said tire building drum.

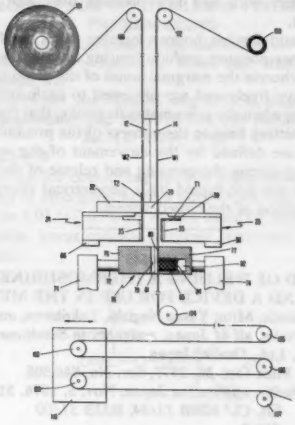
4,190,483

BUTT SPLICER

Ralph L. Ryan, East Hanover, and Charles M. Taitel, Parsippany, both of N.J., assignors to Compensating Tension Controls, Inc., West Caldwell, N.J.

Continuation of Ser. No. 777,586, Mar. 15, 1977, abandoned.
This application Jun. 15, 1978, Ser. No. 915,880
Int. Cl.[2] B65H *21/00*
U.S. Cl. 156—504 **7 Claims**

1. Apparatus for butt splicing the end of a supply web to a running web including stationary knife means having a pair of spaced knife edges; first and second moveable knife members each selectively cooperating with a respective one of said knife edges to sever said running web; means on said stationary knife means for holding the end of said supply web at either of said knife edges, the running web being positioned on the opposite side of said stationary knife means from the supply web and between the knife edge and the moveable knife member cooperating therewith; each of said knife members including a leading surface, means on each said surface for holding the lower portion of a strip of adhesive tape, and means providing a recess adjacent each said leading surface for receiving the upper portion of a strip of tape carried by the moveable knife which is adjacent the running web; means for moving the moveable knife member adjacent the supply web into a ready position where the leading surface thereof is aligned with the



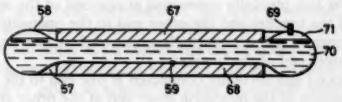
end of the supply web and holds the end of a strip of tape which is affixed to the end of the supply web, and means for moving said knife member adjacent to the running web toward the other knife member so that the running web is cut and the leading surfaces act against each other to press the two tape strips to opposite sides of the web ends, each said recess being formed to keep the upper portion of the tape strip out of contact with the web ends during the splicing operation until it is drawn from the recess by movement of the spliced web.

4,190,484

PRESS FOR PRODUCING SHAPED ARTICLES

Andreas P. I. Pohl, Munich, Fed. Rep. of Germany, assignor to Rembert Duvelius and Rudiger Graf Von Stosch, both of, Fed. Rep. of Germany

Division of Ser. No. 733,193, Oct. 18, 1976, Pat. No. 4,080,243.
This application Sep. 28, 1977, Ser. No. 837,176
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1975, 2546944; Aug. 10, 1976, 2635924
Int. Cl.[2] B32B *31/00*; B30B *1/23*
U.S. Cl. 156—580 **7 Claims**



1. A press to apply pressure to a three dimensional shaped article which comprises:
(a) a first horizontal pressing plate and a second horizontal pressing plate facing each other with a nip therebetween;
(b) a flexible hollow member disposed against said first horizontal pressing plate on the side opposite said nip, said flexible hollow member being a part of a closed system containing a pressure medium and means for regulating

the pressure of said pressure medium said flexible hollow member being formed from non-stretchable metal sheets;

(c) an inflexible support behind said flexible hollow member, whereby upon a change of the pressure of said pressure medium, said first horizontal pressing plate is caused to move relative to said second horizontal pressing plate; and

(d) a flexible hollow member marginal zone projecting beyond all sides of said first horizontal pressing plate and inflexible support and forming a hollow space which is larger than the remainder of said flexible hollow member in contact with said first pressure plate and inflexible support;

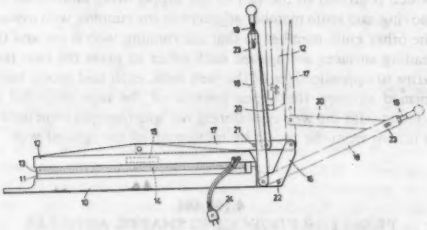
wherein said flexible hollow member takes the form of a large-area pressure cushion bearing against the pressure plate, wherein the marginal zones of the pressure cushion can move freely and are subjected to exclusively tensile stressing when the press makes its stroke, that the pressure and upsetting lines at the corners of the pressure cushion which are defined by the movement of the wall zones occuring during the pressing and release of the pressure cushion are interrupted by a geometrical change in the cross-section of the closed system.

4,190,485

METHOD OF WELDING A THERMOSHRINKABLE SHEET AND A DEVICE FOR USE IN THE METHOD

Kazutoki Takeda, Mito; Yasuo Negishi, Yokohama, and Yutaka Hibino, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 26, 1977, Ser. No. 846,505
Claims priority, application Japan, Nov. 5, 1976, 51/133349
Int. Cl.[2] B30B *15/34;* B32B *31/00*
U.S. Cl. 156—583.9 **3 Claims**



1. A device for use in welding overlapping ends of a synthetic resin sheet, which comprises:

a base;

a bracket extending upwardly from the rear end of the base;

a receiving plate fixedly mounted on the base;

an openable board with a thermosensitive element incorporated therein;

a pressing plate secured to the openable board having a heater incorporated therein;

a first link pivotally connected at one end of the upper end of the bracket and the other end to the openable board;

an operation lever pivotally connected at one end to the lower end of the bracket;

a second link pivotally connected at one end to the free end portion of the operation lever and at the other end to the first link;

whereby the operation lever, and the first and second links constitute a power amplifier mechanism when the pressing plate is pressed against the receiving plate on which the overlapping ends of the sheet are placed while the cylindrical materials are placed under the base; and

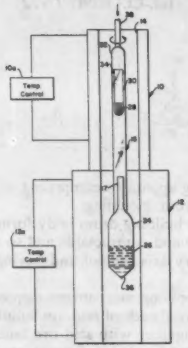
an adjustment means for adjusting the toggle linkage which comprises a thumb screw threaded into the free end of the operation lever, and a pivot serving as a fulcrum of the second link, the pivot being inserted into a slot provided adjacent the free end of the operation lever so that the end of the thumb screw abuts the end of the second link.

4,190,486

METHOD FOR OBTAINING OPTICALLY CLEAR, HIGH RESISTIVITY II-VI, III-V, AND IV-VI COMPOUNDS BY HEAT TREATMENT

Nanse R. Kyle, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 403,577, Oct. 4, 1973, abandoned. This application Mar. 8, 1977, Ser. No. 775,667
Int. Cl.[2] B01J *17/36*
U.S. Cl. 156—601 **26 Claims**



26. A method for heat treating a II–VI, III–V and IV–VI compound comprising the step of separately applied coordinated decreasing of overpressure of one compound constituent with lowering of compound temperature within the pressure-temperature region corresponding to the area of the pressure-temperature phase diagram of the compound bounded by the line of constituent minimum pressure and the line of compound stoichiometry.

4,190,487

REACTIVE ATMOSPHERE PROCESSING METHOD OF CRYSTAL GROWTH OF ALKALINE EARTH CHLORIDES

Ricardo C. Pastor, Manhattan Beach, and Antonio C. Pastor, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 645,151, Dec. 30, 1975, abandoned. This application Feb. 21, 1978, Ser. No. 879,551
Int. Cl.[2] B01J *17/08, 17/18;* C01B *9/02*
U.S. Cl. 156—617 SP **11 Claims**

1. A process for growing ultra-pure large single crystals of alkaline earth metal chlorides comprising the steps of:

(a) charging a crystal growth crucible with an alkaline earth metal chloride,

(b) raising the temperature of said crucible to render said charge molten by placing said crucible in a furnace,

(c) passing a mixture of an inert carrier gas and vapors from a carbonaceous chloride selected from the group consisting of CF_3Cl, CH_3Cl, CH_2Cl_2, $C_6H_5CH_2Cl$, and mixtures thereof having a pyrolytic decay constant between 0.9×10^{-2} and 10^{-1} seconds^{-1} at the melting point of said metal chloride through said crucible at a preselected flow rate, and thereby causing a reactive atmosphere containing nascent chlorine to be created,

(d) creating a temperature gradient across said crucible by passing a coolant through one end of said crucible thereby lowering the temperature of said charge and initiating a recrystallization of said molten charge,

(e) slowly pulling a single crystal from said molten melt in

Bridgman-Stockbarger style until all of said crystal has been removed from the hot zone of said furnace, and

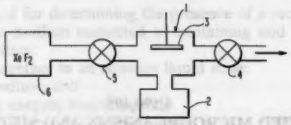
(f) maintaining a steady purge of said gaseous mixture over said crystal while causing said crystal to cool from its recrystallization temperature at a preselected cooling rate for a period of four hours prior to allowing said crystal to cool to ambient temperatures in the presence of said gaseous purge.

4,190,488

ETCHING METHOD USING NOBLE GAS HALIDES

Harold F. Winters, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1978, Ser. No. 934,731
Int. Cl.[2] C23F *1/00*; H01L *21/306*
U.S. Cl. 156—643 **16 Claims**



1. A method for etching a surface comprising exposing the surface to be etched to at least one noble gas halide for a sufficient time to etch said surface to the desired extent.

4,190,489

GOLD ETCHANT COMPOSITION AND METHOD

Surinder K. Bahl, and Gale L. Leach, both of Dayton, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Sep. 21, 1978, Ser. No. 944,631
Int. Cl.[2] C23F *1/00*
U.S. Cl. 156—664 **8 Claims**

4. A method of etching a gold layer from a substrate material comprising the steps of contacting said gold layer with an aqueous solution comprising a mixture of an alkali metal bromide and bromine for a time sufficient to etch away said gold layer.

4,190,490

IMPREGNATION AND DIGESTION OF WOOD CHIPS

George H. Tomlinson, II, Ile Perrot, Canada, assignor to Domtar Inc., Montreal, Canada

Continuation-in-part of Ser. No. 457,453, Apr. 3, 1974, abandoned. This application May 1, 1975, Ser. No. 573,558
Int. Cl.[2] D21C *1/02, 3/22*
U.S. Cl. 162—19 **10 Claims**

1. A method of digesting small chips to produce a chemical wood pulp comprising; presteaming said chips in a presteamer, continuously introducing said presteamed chips and a chemical-containing impregnation liquor into an impregnation zone in an impregnator to form a mixture consisting essentially of all of said chips and impregnation liquor in said impregnator, said mixture having a consistency of less than 10%, said liquor in said mixture containing a substantial excess of said chemical over that required for subsequent digestion of the chips, continuously passing said mixture through said impregnation zone, agitating said mixture substantially throughout said zone during passage of said mixture through said zone thereby to maintain said consistency substantially constant whereby residence time of said chips in said impregnation zone is substantially uniform, continuously withdrawing said mixture from said impregnator after passage through said zone, removing said chips, impregnated with sufficient chemical for subsequent digestion, from excess impregnation liquor, returning at least a portion of said excess liquor to said impregnation zone together with a fortifying amount of cooking chemical, introducing said separated impregnated chips into a cooking zone and digesting said impregnated chips in said cooking zone.

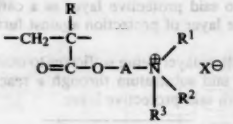
4,190,491

PROCESS FOR CONTROLLING PITCH IN PAPERMAKING

Thomas J. Drennen, Lafayette Hills, and Robert A. Gill, Abington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 710,823, Aug. 2, 1976, abandoned. This application Aug. 24, 1978, Ser. No. 936,537
Int. Cl.[2] D21C *9/08*
U.S. Cl. 162—76 **6 Claims**

1. A process for controlling pitch in papermaking comprising the step of incorporating in a pitch-containing paper pulp slurry about 0.01 to 0.05% by weight based on pulp solids of a water-soluble, linear cationic polymer comprised of units of the formula:



wherein

A is a (C_2–C_3) alkylene group,

R is H or CH_3;

R^1 is a hydroxyethyl or hydroxypropyl group,

R^2 is a (C_1–C_4) alkyl group,

R^3 is a (C_1–C_4) alkyl group, and

X is an anion;

said polymer having a viscosity average molecular weight of about 35,000 to 70,000.

4,190,492

METHOD OF PRODUCING ACOUSTICAL FIBERBOARD

Lewis W. Eckert, and Olivia D. Stewart, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 21, 1977, Ser. No. 862,845
Int. Cl.[2] D21H *5/18*
U.S. Cl. 162—145 **4 Claims**

1. A method for increasing the sound absorption of a conventional acoustical fiberboard of the type produced by removing water from an aqueous fiberboard slurry comprising mineral wool fibers and a binder, the improvement comprising incorporating agglomerated particles into said aqueous fiberboard slurry prior to removing water from said slurry, said agglomerated particles being in the form of balls having diameters of from about 0.03 to about 0.4 inch, being formed from an aqueous composition comprising fiberboard dust, 0.5 to about 3 percent by weight of the aqueous composition of a glactomannan gum or glactomannan gum derivative, and 0.02 to about 2.5 percent by weight of a crosslinking agent, and being incorporated in an amount to yield an agglomerated particle-fiberboard slurry solids ratio of from about 10 to about 50 weight percent agglomerated particles to about 50 to about 90 weight percent fiberboard slurry solids.

4,190,493

COATED STRUCTURAL COMPONENT FOR A HIGH TEMPERATURE NUCLEAR REACTOR

Kim S. Yee, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 660,862, Feb. 24, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,422

Claims priority, application Switzerland, Feb. 26, 1975, 2420/75

Int. Cl.² B32B *15/00*

U.S. Cl. 176—60 **4 Claims**

1. In a helium cooling circuit of a high temperature nuclear reactor, a structural component comprising

a substratum of a nickel-base alloy containing a carbide-former, said alloy comprising in percent by weight at least

0.02 to 0.15% carbon

5.5 to 16% chromium

3 to 13% of the sum of molybdenum and tungsten

6 to 11% of the sum of aluminum and titanium

and the remainder being nickel;

an intermediate layer of nickel of at least 99% purity anchored on at least a portion of said substratum; and

a pore-free protective layer on said intermediate layer of a metal selected from the group consisting of tungsten and molybdenum, said protective layer being sufficient to bond carbon from carbon containing impurities in said circuit into said protective layer as a carbide to form a very stable layer of protection against further carbonization;

said intermediate layer being sufficient to inhibit a decarbonization of said substratum through a reaction of carbon therein with said protective layer.

4,190,494

SPACER WITH POLYGONAL INTERCONNETORS

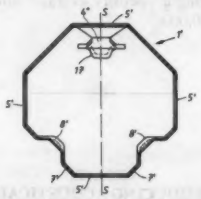
Torsten Olsson, Västerås, Sweden, assignor to Aktiebolaget ASEA-ATOM, Västerås, Sweden

Filed Mar. 23, 1978, Ser. No. 889,304

Claims priority, application Sweden, Dec. 21, 1977, 7714562

Int. Cl.² C21C *3/30*

U.S. Cl. 176—76 **9 Claims**



1. A spacer assembly for supporting a plurality of vertically arranged fuel rods while efficiently mixing a cooling medium horizontally therethrough, said spacer assembly comprising:

at least one spacer cell having similar upper and lower polygonally shaped members interconnected by at least one oblong spring assembly, said polygonally shaped members adaptable for surrounding and supporting an individual fuel rod extending therethrough;

said spring assembly including a middle portion lying substantially within a vertical plane extending through said spacer assembly, said middle portion being biased into supporting contact with said fuel rod;

substantially straight upper and lower spring members joining said upper and lower polygonally shaped members with said middle portion;

said upper and lower spring members each including a first substantially straight section attached to a respective polygonal member and extending toward said fuel rod, said upper and lower spring members each including a second substantially straight section attached to said middle portion and extending away from said fuel rod and further including a third substantially straight section joining said first and second sections to form a pair of oblique angles therebetween;

whereby a vertically flowing cooling medium located adjacent to said fuel rod is provided with a net horizontal flow component directed away from said fuel rod.

4,190,495

MODIFIED MICROORGANISMS AND METHOD OF PREPARING AND USING SAME

Roy Curtiss, III, Birmingham, Ala., assignor to Research Corporation, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 727,365

Int. Cl.² C12K *1/02*

U.S. Cl. 435—172 **11 Claims**

1. In an operation wherein recombinant DNA-containing cloning vector is introduced into or is present in a microorganism for replication therein and wherein said microorganism is grown for replication of said cloning vector, the improvement which comprises employing as said microorganism a microorganism having the following characteristics:

(a) said microorganism being capable of having recombinant DNA or foreign genetic information introduced thereinto and recovered therefrom along with its expression or production of useful gene products;

(b) said microorganism being dependent for growth and survival upon defined conditions;

(c) said microorganism being incapable of establishment, growth or colonization and/or survival under conditions or in ecological niches that are non-permissive for said microorganism;

(d) said microorganism being capable of causing recombinant DNA or foreign genetic information incorporated therein to undergo degradation under conditions or ecological niches that are considered non-permissive for said microorganism;

(e) said microorganism being capable of permitting cloning vectors containing recombinant DNA or foreign genetic information incorporated therein to be dependent for their replication, maintenance and/or function on said microorganism.

(f) said microorganism being substantially incapable of transmitting cloning vectors containing recombinant DNA or foreign genetic information incorporated therein to other organisms under non-permissive conditions for said microorganism;

(g) said microorganism being capable of being monitored by suitable means and/or techniques without substantial alteration of said microorganism; and

(h) said microorganism being susceptible of substantially minimal contamination with other organisms when recombinant DNA or foreign genetic information is incorporated therein and being substantially incapable of contaminating other organisms when incorporated therein or consumed thereby when recombinant DNA or foreign genetic information is present in said microorganism.

4,190,496

HOMOGENEOUS ENZYME ASSAY FOR ANTIBODIES

Kenneth E. Rubenstein, Menlo Park, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 760,499, Jan. 19, 1977, which is a continuation-in-part of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774, which is a continuation of Ser. No. 481,022, Jun. 20, 1974, abandoned, and a continuation-in-part of Ser. No. 689,234, May 24, 1976, Pat. No. 4,046,636, which is a continuation-in-part of Ser. No. 481,022, Jun. 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Jun. 2, 1977, Ser. No. 802,683

The portion of the term of this patent subsequent to Jun. 18, 1991, has been disclaimed.

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—7 5 Claims

1. A method for determining the presence of a receptor for a ligand in a medium suspected of containing said receptor, which comprises:

bringing together in an aqueous liquid zone:

(1) said medium; and

(2) soluble enzyme bound ligand;

wherein said enzyme bound ligand is at a concentration resulting in substantial reduction in enzymatic activity of said enzyme-bound-ligand in the presence of receptor in the concentration range of interest; and

analyzing in said zone for the effect of said medium on the enzymatic activity of said enzyme bound ligand.

4,190,497

APPARATUS FOR HEATING UP A CHAMBER OF A COKING BATTERY

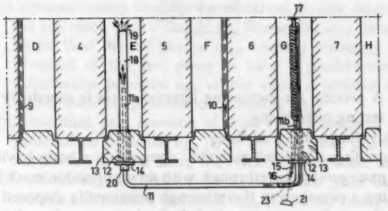
Günther Lagemann, and Wilhelm Heisterkamp, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Division of Ser. No. 741,186, Nov. 12, 1976, Pat. No. 4,111,756. This application May 31, 1978, Ser. No. 911,410

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1976, 2551197

Int. Cl.[2] C10B *17/00, 25/06*

U.S. Cl. 202—150 1 Claim



1. A coking battery comprising a plurality of coking oven chambers; coking oven doors each having an opening therein; conduit means adapted to be received in the openings of said coking oven doors and connecting at least two coking oven chambers; means connecting said conduit means to said doors; said conduit means having upstream and downstream ends that extend into the respective coking oven chambers; and pump means for drawing gas by jetpump action from a first oven chamber into an upstream end of said conduit means and expelling said gas from a downstream end of said conduit means into a second oven chamber, said pump means comprising source means of relatively cool gas under pressure, pipe means connected to said gas source means and having a nozzle end in said conduit directed therein toward said downstream end, said pipe means having a coiled section between said source means and said nozzle end which lies within said first chamber, whereby gas in said coiled section is heated conductively through the walls of said pipe means, and a tube of larger diameter than said conduit means at said downstream end concentrically receiving said conduit means at said downstream end with annular spacing therebetween and extending beyond the downstream end of said conduit means, said tube having an outer end opening outside said second chamber.

4,190,498

SYSTEM TO ACQUIRE AND MONITOR OPERATING MACHINERY POSITIONS FOR HORIZONTAL COKE OVEN BATTERIES

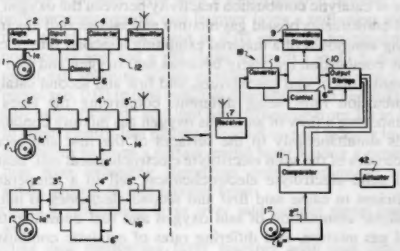
Wolfgang Teschner, Ratingen-Hüsel, and Dieter Bierbaum, Herne, both of Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,444

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701930

Int. Cl.[2] C10B *33/10*

U.S. Cl. 202—262 10 Claims



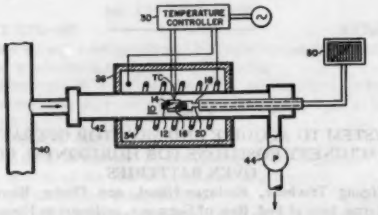
1. A system for detecting the relative position of a first coke device on one side of a horizontal coke oven battery with respect to the position of a second coke device on an opposite side of the horizontal coke oven battery and for activating the second coke device when the relative positions correspond along the coke oven battery, comprising a first wheel mounted on the first coke device for rotation with the movement of the first coke device along the coke oven battery, a first angle encoder connected to said first wheel for producing a first numerical value signal corresponding to the rotation of said first wheel and to the position of the first coke device along the coke oven battery, an input storage means which includes a code disc connected to said first angle encoder for recording and durably storing said first numerical value signal as a code pattern on said code disc, a second wheel mounted on the second coke device for rotation with the movement of the second coke device along the coke oven battery, a second angle encoder connected to said second wheel for producing a second signal corresponding to the rotation of said second wheel and the position of the second coke device along the coke oven battery, a comparator connected to said second angle encoder for receiving said second signal, a data link connected between said input storage means and said comparator for relaying said first numerical value signal to said comparator whereby said comparator compares said first numerical value signal with said second signal, and an actuator means connected to said comparator for actuating the second coke device when said first and second signals correspond to indicate the correspondence of positions of the first and second coke devices along the coke oven battery.

4,190,499

COMBUSTIBLES SENSOR

Alfred R. Pebler, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 345,393, Mar. 27, 1973, Pat. No. 4,005,001.
This application Jul. 29, 1974, Ser. No. 492,955
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—1 T 3 Claims



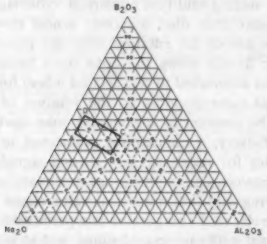
1. A method for determining the presence of fuels in an excess oxygen gas mixture through the use of an oxygen ion conductive solid electrolyte electrochemical cell having a first and second electrode disposed on opposite surfaces thereof, said first electrode composed of a material for supporting a first rate of catalytic combustion reactivity between the oxygen and fuel constituents of said gas mixture and said second electrode being composed of a material exhibiting a second rate of catalytic combustion reactivity between said oxygen and said fuel constituents of said gas mixture, said first and second catalytic combustion rates being different, comprising the steps of, maintaining a flow of an excess oxygen gas mixture containing fuels simultaneously to the surfaces of the first and second electrodes of the solid electrolyte electrochemical cell, heating said solid electrolyte electrochemical cell to a temperature sufficient to cause said first and second electrodes to initiate catalytic combustion of said oxygen and fuel constituents of said gas mixture, said differing rates of catalytic combustion produced by said first and second electrodes producing a solid electrolyte electrochemical cell output signal at said electrodes, and monitoring the output signal developed by said solid electrolyte electrochemical cell as an indication of the fuel constituents of said gas mixture.

4,190,500

SODIUM ION CONDUCTING SODIUM ALUMINUM BORATE GLASSES

Charles L. Booth, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 19, 1978, Ser. No. 916,915
Int. Cl.[2] H01M 6/18
U.S. Cl. 204—1 R 29 Claims



1. Method comprising electrically conducting sodium ions through a glass whose components lie within the area of the quadrilateral ABCD of the Na_2O, B_2O_3 and Al_2O_3 ternary diagram of FIG. 1 where the points A, B, C and D are defined by the mole percentages:

	Na_2O	B_2O_3	Al_2O_3
A	52	43	5
B	42	33	25
C	33	42	25
D	43	52	5

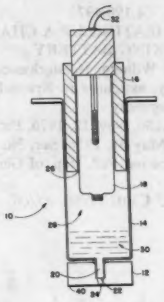
the mole percentages of the components within the quadrilateral totaling 100%, said glass containing additionally about 2 to 11 mole percent of at least one of ZrO_2, MgO, P_2O_5 and SiO_2.

4,190,501

PROCESS FOR MEASURING INTERNAL METAL STRESS

Olen L. Riggs, Jr., Bethany, Okla., assignor to Transworld Drilling Company, Oklahoma City, Okla.

Filed Aug. 21, 1978, Ser. No. 935,549
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—1 T 5 Claims



1. A process for measuring internal stress in metals by surface testing comprising:

providing a metal surface;

providing a half-cell assembly comprising a body having a passageway therethrough with a compressible mask having a passageway therethrough positionally disposed and mounted upon one end of the body surrounding the passageway therethrough and in communicating alignment therewith, a reference electrode half-cell with a wiping collar having a passageway therethrough positionally disposed and mounted about the reference electrode half-cell, the wiping collar being at least partially inserted within the open end of the passageway through the body opposite the end whereon the compressible mask is positioned, and a saturated electrolyte solution contained in the passageway within the body;

positioning the passageway through the compressible mask of the half-cell assembly in juxtaposition with the metal surface;

compressing the compressible mask against the metal surface by application of axial force; and

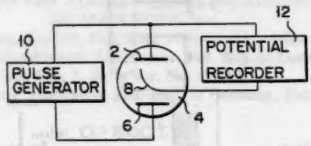
measuring the electrical potential between the metal surface and the reference electrode half-cell.

4,190,502

METHOD OF EVALUATING THE CORROSION RATE OF METAL

Ken-ichi Kanno; Masayuki Suzuki, both of Yokohama; Yuichi Sato, Atsugi, and Masamichi Machida, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 10, 1978, Ser. No. 950,051
Claims priority, application Japan, Oct. 7, 1977, 52-120779
Int. Cl.[2] G01N *27/46, 27/30*
U.S. Cl. 204—1 T 19 Claims



1. A method of evaluating the corrosion rate of metal in a corrosive solution, comprising:

(A) the step of determining the polarization resistance R_p of a metal test piece having a surface area S and disposed in a corrosive solution, said step comprising:

(i) instantaneously feeding a given charge q_{Rp} to the electrical double layer of the test piece, thereby changing the potential of the test piece to have a predetermined polarization potential n_{Rp};

(ii) detecting, as a function of time, the variation of the polarization potential n_{Rp} (t) of the test piece due to a corrosion reaction, using a reference electrode disposed in the corrosive solution;

(iii) estimating an initial polarization potential n_{Rp} (0) of the test piece upon completion of the charge supply (t=0), based on the polarization potential n_{Rp} (t) detected as a function of time; and

(iv) calculating the polarization resistance R_p based on the given charge q_{Rp}, initial polarization potential n_{Rp} (0), surface area S, and the slope of log n_{Rp} (t)-t relation;

(B) the step of determining the Tafel slope β_a of anodic reaction of the metal test piece, said step comprising:

(i) instantaneously feeding the electrical double layer of the test piece with a charge $q_{\beta a}$ whose absolute value is larger than that of charge q_{Rp}, thereby changing the potential of the test piece to have a predetermined polarization potential $n_{\beta a}$ whose value is positive and higher than the polarization potential n_{Rp};

(ii) detecting, as a function of time, the variation of the polarization potential $n_{\beta a}$ (t) of the test piece due to a corrosion reaction, using the reference electrode; and

(iii) calculating the Tafel slope β_a of the test piece based on the polarization potential $n_{\beta a}$ (t) of the test piece detected as a function of time,

(C) the step of determining the Tafel slope β_c of cathodic reaction of the metal test piece, said step comprising:

(i) instantaneously feeding the electrical double layer of the test piece with a charge $q_{\beta c}$ whose absolute value is larger than that of the charge q_{Rp} and whose polarity is opposite to that of the charge $q_{\beta a}$, thereby changing the potential of the test piece to have a predetermined polarization potential $n_{\beta c}$ whose value is negative;

(ii) detecting, as a function of time, the variation of the polarization potential $n_{\beta c}$ (t) of the test piece due to a corrosion reaction, using the reference electrode; and

(iii) calculating the Tafel slope β_c of the test piece based on the polarization potential $n_{\beta c}$ (t) of the test piece detected as a function of time, and

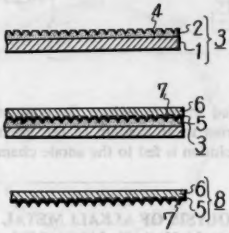
(D) the step of calculating the corrosion current density I_{corr} of the metal test piece based on the polarization resistance R_p, anodic Tafel slope β_a and cathodic Tafel slope β_c.

4,190,503

METHOD OF MANUFACTUREING A RECORD MATRIX

Jiro Ikeda, Fujieda, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,237
Claims priority, application Japan, Dec. 28, 1977, 52/160613; Oct. 19, 1978, 53/128748
Int. Cl.[2] C25D *1/10, 1/20;* C23C *3/02, 7/00*
U.S. Cl. 204—5 14 Claims



1. A method of manufacturing a record matrix comprising the steps of:

preparing a lacquer layer with a sound groove therein;

jointly spraying against said lacquer layer a reduction solution which contains 0.015 to 0.03 mol/l of borohydride compound and has a pH value from 10.5 to 11.5, and a metal salt solution which contains 0.02 to 0.04 mol/l of nickel salt, 0.02 to 0.04 mol/l of ammonium salt and 0.02 to 0.07 mol/l of lactic acid and has a pH value from 2.0 to 3.0 to effect electro-less plating of nickel on said lacquer layer and hence to form a surface metal layer having a projection strip extending therefrom corresponding to said sound groove in said lacquer layer;

forming a reinforcing layer over said surface metal layer; and

peeling said reinforcing layer together with said surface metal layer from said lacquer layer along the boundary surface therebetween.

4,190,504

ANTICORROSIVE OVERLAP-COATED STEEL MATERIAL

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 6, 1978, Ser. No. 949,132
Claims priority, application Japan, Nov. 11, 1977, 52/135304; Nov. 11, 1977, 52/135305
Int. Cl.[2] C25D *5/10, 5/48, 5/26*
U.S. Cl. 204—35 R 2 Claims

1. An anti-corrosive overlap-coated steel material made by forming an electroplated layer of an Sn base-Zn alloy directly on the skin surface of an iron or steel material, then forming an electroplated layer of zinc on said alloy layer and further applying a chromate-treatment on said zinc layer.

4,190,505

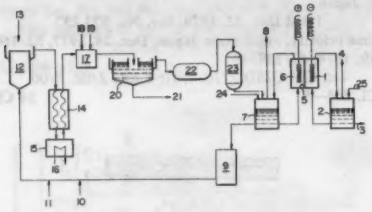
ELECTROLYSIS OF SODIUM CHLORIDE IN AN ION-EXCHANGE MEMBRANE CELL

Shinsaku Ogawa; Mitsuo Yoshida, and Hiroyuki Shiroki, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1978, Ser. No. 948,659
Claims priority, application Japan, Oct. 8, 1977, 52/120512; Nov. 26, 1977, 53/142061
Int. Cl.[2] C25B *1/16, 1/26*
U.S. Cl. 204—98 10 Claims

1. A process for the electrolysis of sodium chloride in an electrolytic cell divided into an anode chamber and a cathode

chamber by a cation exchange membrane, wherein an aqueous solution of sodium chloride containing an iron cyanide complex is purified so as to reduce the content of iron cyanide complex therein to an amount of not greater than 0.5 ppm before said solution is fed to the anode chamber.



4,190,506

ELECTROLYSIS OF ALKALI METAL CHLORIDE

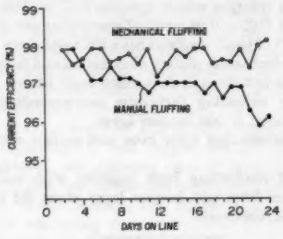
Nobuhiro Kawasaki; Naoki Yoshida, and Takashi Yoshitugu, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Nov. 17, 1978, Ser. No. 961,553

Claims priority, application Japan, Jan. 11, 1978, 53-1119

Int. Cl.[2] C25B *1/16, 1/26, 13/06*

U.S. Cl. 204—98 **6 Claims**



1. A method of electrolyzing an alkali metal chloride in a diaphragm electrolytic cell equipped with an asbestos diaphragm wherein said diaphragm is made, without the use of a polyameric binder, by the process comprising the steps of:

fluffing an asbestos fiber with a turbo rotary mill, with substantially no breakage of the asbestos fiber;

suspending the fluffed asbestos in a solution of a base; and depositing the suspended asbestos fiber on a wire net cathode for diaphragm electrolysis of an alkali metal chloride.

4,190,507

PROCESS FOR CONCENTRATING TRITIUM AND/OR TRITIUM HYDRIDE AND SEPARATING IT FROM TRITIUM WATER

Hans Hesky, Runkel, and Armin Wunderer, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

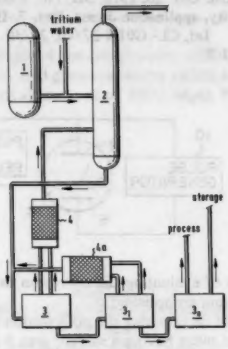
Filed Mar. 14, 1978, Ser. No. 886,518

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711366

Int. Cl.[2] C25B *1/04*

U.S. Cl. 204—129 **3 Claims**

1. Process for recovering tritium and/or tritium hydride from tritium-containing water comprising the steps of vaporizing and removing tritium-free water, thereby leaving a stream consisting essentially of tritium hydroxide and di-tritium oxide and then electrolyzing the enriched mixture to obtain a high concentration of tritium and/or tritium hydride.



3. A process according to claim 1, wherein the enriched mixture is electrolyzed in an electrolytic enrichment cascade consisting of a series of electrolytic cells.

4,190,508

PROCESS FOR REMOVING CHALCOPHILE ELEMENTS FROM AQUEOUS SOLUTIONS BY ELECTROLYSIS

Hiroshi Kametani, and Tatsuya Mitsuma, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 1, 1979, Ser. No. 16,567

Claims priority, application Japan, Jun. 23, 1978, 53-75488

Int. Cl.[2] C02C *5/12*

U.S. Cl. 204—151 **10 Claims**

1. A process for removing a chalcophile element from an aqueous solution containing said element in the form of ion, which comprises electrolyzing said aqueous solution as a catholyte under acidic conditions in the presence of elemental sulfur powder suspended therein to precipitate the chalcophile element in the form of sulfide, and separating the precipitated sulfide from the aqueous layer.

4,190,509

ELECTROCHEMICAL PROCESS FOR THE REMOVAL OF CONTAMINANTS FROM AQUEOUS MEDIUM

Charles M. Chaffin, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1979, Ser. No. 13,857

Int. Cl.[2] C02C *5/12*

U.S. Cl. 204—152 **5 Claims**

1. In a method for electrochemically removing from an ionizing medium a contaminant ion which is capable of forming an insoluble iron compound or complex, which comprises passing an electric current through the ionizing medium containing the ion to be removed between an anode which has a surface or a portion of a surface thereof of iron, iron alloy or insoluble iron compound, and a cathode so as to produce anodically an insoluble iron compound, species or complex in said ionizing medium while cathodically reacting said contami-

nant ion with the ionizing medium to generate an insoluble hydroxide thereof and whereby an insoluble iron compound or complex with the contaminant ion is produced, and removing said insoluble iron compound or complex with the contaminant ion from the ionizing medium, the improvement wherein the medium contained between the anode and the cathode is periodically vigorously agitated with a compressed gas.

4,190,510

PROCESS FOR THE ELECTROPHORETIC BREAKING OF EMULSIONS

Wolfgang Larbig, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 7, 1979, Ser. No. 10,287

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808225

Int. Cl.² B03C *5/00*

U.S. Cl. 204—180 R **9 Claims**

1. A process for electrophoretic breaking of electrically conductive emulsions of electrical conductivity greater than 2,000 μMhos which comprises adjusting the conductivity of said emulsion to a value in the range from 0.1 to 2,000 μMhos by increasing the dispersion of said emulsion and thereafter passing therethrough a constant-voltage field of 100 to 1,000 volts.

4,190,511

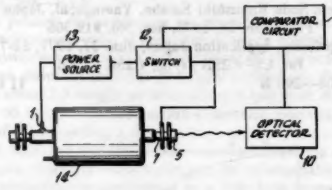
METHOD OF MANUFACTURING AN INTERNAL MIRROR TYPE GAS LASER TUBE

Keiichi Shintaku, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1978, Ser. No. 943,611

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 P **4 Claims**



1. A method of manufacturing an internal mirror type gas laser tube, said laser tube including an internal mirror and an internal anode, the method comprising the steps of, disposing a metallic member in the vicinity of the internal laser tube mirror, exciting an electric discharge by utilizing the internal laser tube anode and by employing said metallic member as a cathode to sputter the metal of said metallic member and to thereby form a metallic film on the surface of said internal mirror, said sputtered metal film reducing the reflection rate of the internal mirror to reduce the laser ouptut power to a predetermined value.

4. A method of manufacturing an internal mirror type gas laser tube comprising the steps of preparing an internal mirror type gas laser tube which has at least one metallic member in the vicinity of an internal laser mirror, measuring the output power of said gas laser, internally sputtering said metallic member to form a metallic film on said internal mirror and stopping the sputtering when the laser output power is reduced to a predetermined value.

4,190,512

SACRIFICIAL ANODES

Brian S. Wyatt, Acton Trussell, and Ronald H. Wassell, Telford, both of England, assignors to I.S.C. Alloys Limited, Bristol, England

Filed May 3, 1978, Ser. No. 902,299

Int. Cl.² C23F *13/00*

U.S. Cl. 204—196 **9 Claims**

1. An arrangement for use in the cathodic protection of submarine bodies and structures, for example, pipelines including a plurality of anode bodies, each body including a first part which is constituted by a material which is electro-chemically active and a supporting core structure for the first part, the supporting structure being less electro-chemically active than the first part and defining a plurality of apertured regions along the body, said structure including a plurality of longitudinally extending members and a plurality of transversely extending members at least one of said transversely extending members being located near an end of said body and extending transversely beyond the edges of the body.

4,190,513

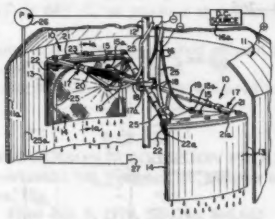
APPARATUS FOR CONTAINERLESS PORTABLE ELECTRO-POLISHING

John F. Jumer, 161 W. 131 Timber Trails Dr., Oak Brook, Ill. 60521

Filed Sep. 18, 1978, Ser. No. 943,371

Int. Cl.² C25F *3/16, 7/00*

U.S. Cl. 204—224 R **14 Claims**



1. In apparatus for electro-polishing relatively large surface areas having substantially uniform configuration, the improvement comprising,

a cathode support frame having cathode support portions conforming substantially to said configuration,

a permeable electrolyte-retaining blanket of uniform thickness and formed of dielectric material mounted on said frame by attachment to said conforming cathode support portions with an exposed outer surface facing outwardly from said frame for engagement with said surface areas and the opposite inner surface thereof facing inwardly,

foraminous cathode means mounted on said frame by attach-

ment to said conforming cathode support portions and in engagement with said inner surface of said blanket and spaced by said blanket a uniform distance from said surface areas, and

spray means for supplying electrolyte to said inner surface of said blanket.

4,190,514

ELECTROLYTIC CELL

Shunji Matsuura, Tokuyama; Toshio Oku, Yamaguchi; Masaaki Kurumatani, Tokuyama; Nobuyuki Kuramoto, Tokuyama, and Yasutaka Ozaki, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

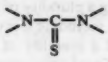
Filed Jun. 6, 1978, Ser. No. 912,987

Claims priority, application Japan, Jun. 6, 1977, 52-65854; Oct. 28, 1977, 52-128794

Int. Cl.[2] C25D *3/12;* **C25B** *11/02*

U.S. Cl. 204—242 **8 Claims**

8. A cathode for employment in an electrolytic cell which cathode comprises a supporting structure comprising (1) iron, (2) nickel, or (3) an alloy composed mainly of at least one member of the group of iron and nickel, said supporting structure having a nickel coating formed thereon by electroplating said supporting structure in a nickel electroplating bath in the presence of a S/N substance, said substance being at least one member selected from the group consisting of a thiocyanate ion, a thiosulfate ion, a dithiocarbamate ion, a thiocarboxylate ion, an amino acid ion, a thiocarbamoyl compound and thiourea wherein the thiocarbamoyl group and the group



are regarded anions, and said S/N substance being present in the electroplating bath in an amount of at least 0.1 ion equivalent per equivalent of nickel present as an ion in the bath.

4,190,515

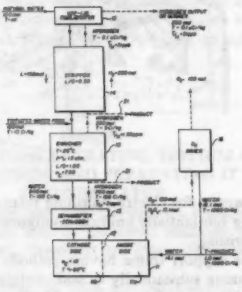
APPARATUS FOR REMOVAL AND RECOVERY OF TRITIUM FROM LIGHT AND HEAVY WATER

John P. Butler, and Martin Hammerli, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 18, 1978, Ser. No. 907,105

Int. Cl.[2] C25B *1/10, 1/00;* **C01B** *4/00;* **C01G** *57/00*

U.S. Cl. 204—266 **5 Claims**



1. Apparatus for removal of tritium from light and heavy water comprising:

(a) a catalyst isotope exchange column enricher with means for passing hydrogen gas and liquid water therethrough in countercurrent isotope exchange relationship,

(b) an electrolysis cell having an anode side and a cathode side and a separator therebetween,

(c) a dehumidifier-scrubber,

(d) means for passing the liquid water enriched in tritium from the catalyst column through the dehumidifier-scrubber to the electrolysis cell,

(e) means for passing the hydrogen gas evolved in the cathode side of the cell through the dehumidifier-scrubber to the catalyst column, said dehumidifier-scrubber adapted to adjust the humidity of the tritium depleted hydrogen gas to the conditions prevailing in the enricher, to bring the tritium concentration of the water vapor in the gas stream in isotopic equibilibrium with the liquid water from the enricher, and to transfer any entrained electrolyte in the hydrogen gas to the downflowing water stream,

(f) a stripper,

(g) means for passing the hydrogen gas from the catalyst column through the stripper to an output,

(h) means for passing liquid water feed through the stripper to the catalyst tower, said stripper adapted to reduce the tritium content of the already depleted hydrogen by transferring the tritium to the countercurrent stream of liquid water,

(i) means for introducing the tritiated water feed to the upper portion of the catalyst column,

(j) a gas drier,

(k) means for taking the oxygen gas evolved in the anode side of the electrolysis cell and highly tritiated water vapor from the cell and passing it through the gas drier to remove the water,

(l) means for returning this water to the cell, and

(m) means for taking a tritium product from the system.

4,190,516

CATHODE

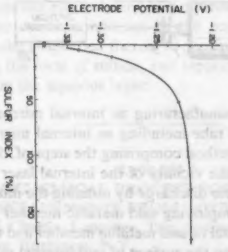
Yoshihisa Kajimaya; Takahide Kojima; Yoshio Murakami, and Shunji Matsuura, all of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Jun. 26, 1978, Ser. No. 919,306

Claims priority, application Japan, Jun. 27, 1977, 52-75610

Int. Cl.[2] C25B *11/08;* **C25R** *11/06*

U.S. Cl. 204—290 R **11 Claims**

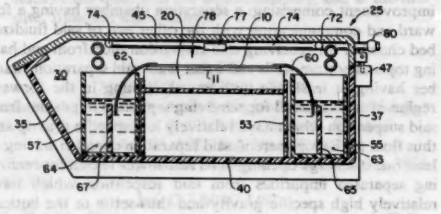


1. A cathode consisting essentially of a base material of copper, iron or nickel and formed thereon, a sintered coating composed mainly of at least one metal of Group VIII of the periodic table, said sintered coating having been prepared by (1) coating said base material with a solution or suspension of at least one sulfur-containing compound of said metal of Group VIII, which sulfur-containing metal compounds are capable of being predominantly converted to a metal by sintering said compounds, and (2) heating the coating, said sintered coating containing at least 3% of sulfur in terms of the sulfur index as defined in the specification.

4,190,517
ELECTROPHORESIS APPARATUS

James F. Monthony, Albany; Timothy E. Delony, San Leandro; Eric G. Wallace, Napa, and Walter H. Schick, Walnut Creek, all of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Aug. 16, 1978, Ser. No. 934,153
Int. Cl.[2] G01N *27/26, 27/28*
U.S. Cl. 204—299 R 19 Claims



1. In apparatus for performing electrophoresis on a sample within a medium, the apparatus including a housing, and a substantially horizontal cooling bed within the housing for supporting the medium and withdrawing heat therefrom during the electrophoresis, the improvement comprising:

a condenser overlying the bed and including a lowermost portion from which water may gravitationally drip, the lowermost portion being located outside a vertical projection of the cooling bed so that water gravitationally dripping from the condenser avoids the cooling bed; and

means for passing a cooling fluid through the condenser during electrophoresis.

4,190,518
SOLVENT REFINED COAL PROCESS

Joseph P. Giannetti, Allison Park, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

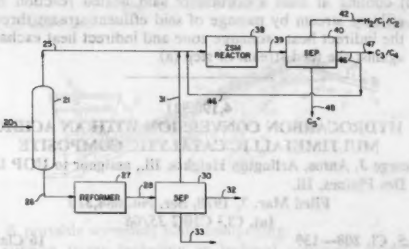
Filed Dec. 29, 1977, Ser. No. 865,605
Int. Cl.[2] C10G *1/00, 1/06*
U.S. Cl. 208—8 LE 12 Claims

1. A process for producing an upgraded material which is solid and/or semi-solid at room temperature having a substantially lower ash, sulfur and nitrogen content from coal containing from about 0.1 to about 30 weight percent ash, from about 0.25 to about 2.5 weight percent nitrogen and from about 0.3 to about 10 weight percent sulfur consisting essentially in the steps of (1) subjecting a slurry composed of said coal containing ash, nitrogen and sulfur and a solvent containing donatable hydrogen, together with hydrogen, to substantially catalyst-free hydrogenation conditions in a first hydrogenation zone wherein the temperature is in the range of about 343° to about 510° C., the pressure is in the range of about 500 to about 5000 psig, the solvent to coal weight ratio is in the range of about 0.5/1 to about 10/1, the hydrogen/coal feed weight ratio is in the range of about 0.01 to about 0.30/1, the hydrogen gas purity is in the range of about 85 to about 100 mole percent and the residence time is in the range of about 0.1 to about 5.0 hours, to form an intermediate coal-solvent slurry; (2) deashing said intermediate coal-solvent slurry to form a coal-solvent solution, said coal-solvent solution being such that in the absence of solvent therein at ambient temperature and pressure left behind would be deashed coal; (3) subjecting said coal-solvent solution to catalytic hydrogenation in a second hydrogenation zone in the presence of a catalyst consisting essentially of nickel, titanium and molybdenum wherein the temperature is in the range of about 260° to about 538° C., the pressure is in the range of about 500 to about 10,000 psig, the liquid hourly space velocity is in the range of about 0.3 to about 10 volume feed/volume catalyst/hour and the hydrogen flow rate is in the range of about 25 to about 190 kmol H_2/m^3 feed to obtain a liquid product, (4) separating said liquid product to obtain (a) said desired upgraded material which is solid and/or semi-solid at room temperature having a substantially lower ash, sulfur and nitrogen content than the coal charge, (b) a first liquid fraction boiling at a temperature in the range of about 100° to about 375° C. and (c) a second liquid fraction boiling above said first liquid fraction at a temperature in the range of about 200° to about 525° C.; and then (5) recycling at least a portion of said second liquid fraction to said first hydrogenation zone.

4,190,519
COMBINATION PROCESS FOR UPGRADING NAPHTHA

Stephen J. Miller, El Cerrito, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 23, 1978, Ser. No. 954,064
Int. Cl.[2] B01J *29/28;* C07C *15/02;* C10G *37/10, 39/00*
U.S. Cl. 208—79 9 Claims



1. A process for upgrading a naphtha-boiling-range hydrocarbon to useful products which comprises:

(1) separating said naphtha just below the boiling point of methylcyclopentane into a light naphtha fraction containing C_6 paraffins and lower-boiling hydrocarbons and a heavy naphtha fraction containing methylcyclopentane and higher-boiling hydrocarbons;

(2) reforming said heavy naphtha fraction under reforming conditions to produce a reformate enriched in aromatic compounds compared with said heavy naphtha fraction;

(3) passing at least a portion of said reformate together with said light naphtha fraction in contact with a ZSM-5-type zeolite catalyst under aromatization conditions including a pressure from 0.5 to 68 atmospheres and a temperature from 343° to 649° C. to produce an aromatics-enriched effluent;

(4) separating said aromatics-enriched effluent into a C_4- fraction and a C_5+ fraction; and

(5) recovering said C_5+ fraction as said product.

4,190,520
HYDROCARBON CONVERSION PROCESS

Steve A. Gewartowski, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 3, 1978, Ser. No. 866,663
Int. Cl.[2] C10G *35/04*
U.S. Cl. 208—95 13 Claims

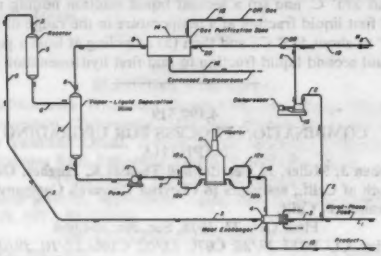
1. A hydrocarbon conversion process which comprises the steps of:

(a) passing a mixed-phase feed stream into an indirect heat exchange zone and effecting the vaporization of a portion of the feed stream and the heating of the mixed-phase feed stream to a desired temperature;

(b) passing the mixed-phase feed stream through a reaction zone maintained at mixed-phase hydrocarbon conversion conditions that effect the production of a mixed-phase reaction zone effluent stream and separating a liquid fraction;

(c) heating at least a portion of the liquid fraction of said mix-

ed-phase reaction zone effluent stream by passage of said portion through a fired heating zone maintained at least 15° F. to 20° F. above the temperature of the reaction zone inlet; and



(d) cooling at least a portion of said heated reaction zone effluent stream by passage of said effluent stream through the indirect heat exchange zone and indirect heat exchange against the feed stream of step (a).

4,190,521

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 7, 1978, Ser. No. 884,310
Int. Cl.² C10G 35/08
U.S. Cl. 208—139 **16 Claims**

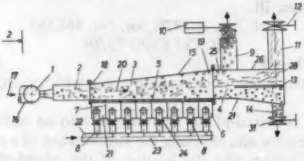
1. A process for reforming a gasoline fraction which comprises contacting the same at reforming conditions with an acidic catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % zinc, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum, catalytically available nickel, and zinc are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,190,522

APPARATUS FOR PURIFYING A SUSPENSION OF FIBROUS MATERIAL

Josef Trü, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,558
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737009
Int. Cl.² B03D 1/24
U.S. Cl. 209—170 **9 Claims**



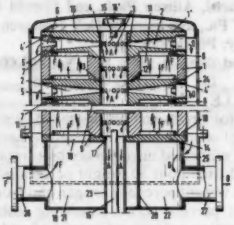
1. In apparatus for removing impurities entrapped in a liquid suspension of fibrous material including a generally horizontal fluidized bed chamber having spaced opposite ends, an imperforate top wall, and a perforated bottom wall, first means for introducing said suspension to said fluidized bed chamber through one end thereof for flow across said bottom wall toward the other end, the space between said bottom and top walls being filled with said liquid suspension from said one and to said other end of said fluidized bed chamber, a pressure chamber below said fluidized bed chamber and communicating with said bottom wall, and second means for introducing a fluidizing agent under pressure to said pressure chamber for upward flow through the perforations in said bottom wall and through the suspension in said fluidized bed chamber thereby to separate impurities from said suspension by flotation, the improvement comprising: a separation chamber having a forward end communicating with the other end of said fluidized bed chamber for receiving said suspension therefrom and having top and bottom walls and a rear wall, said separation chamber having at least one withdrawal opening in the forward region of said top wall for removing separated impurities from said suspension which have relatively low specific gravity and thus float to the top thereof, said separation chamber having at least one discharge opening in its rear lower region for removing separated impurities from said suspension which have relatively high specific gravity and thus settle to the bottom wall thereof, said last-named bottom wall being imperforate apart from said discharge opening, said separation chamber having at least one outlet opening therein in its rear upper region rearwardly of said one opening for removing the purified fibrous suspension therefrom.

4,190,523

RADIAL MULTIHYDROCYCLONE

Klaas B. Niemeijer, Veendam, Netherlands, assignor to Koninklijke Scholten-Honig N.V., Amsterdam, Netherlands

Filed Feb. 13, 1978, Ser. No. 877,551
Claims priority, application Netherlands, Feb. 17, 1977, 7701686
Int. Cl.² B04C 5/28
U.S. Cl. 209—211 **3 Claims**



1. A multihydrocyclone comprising
a plurality of at least three stacked discs formed from polyurethane;
means securing and pressing the discs together;
means forming an overflow chamber surrounding the periphery of the discs;
said discs each having (1) a central duct communicating with the central ducts of the other discs with inner edge means of each disc surrounding the central duct and engaging corresponding inner edge means of the adjacent disc or discs such that the central ducts form a common dischage duct extending centrally through the stacked discs, (2) a plurality of cyclone chambers extending radially relative to the central duct with respective inner drain openings thereof opening into the central duct, (3) overflow duct means in the periphery of each disc at the outer ends of the cyclone chambers and forming overflow ducts between the respective cyclone chambers and the overflow chamber, (4) outer edge means at the periphery of the discs engaging corresponding outer edge means of the adjacent disc or discs whereby the stacked discs are closed to the overflow chamber except for the overflow ducts, (5) an

annular cavity on at least one side of each disc between the inner and outer edge means forming an input chamber, and (6) tangential supply ducts communicating from the input chamber into the respective cyclone chambers;

means forming an input to one side of a first disc on one end of the stack discs; and

all of the discs between the one end of the stacked discs and the disc at the other end of the stack discs each having at least one through passage disposed between the inner and outer edges and communicating between the opposite sides of the discs into the input chambers, and at the first disc, from the input means.

4,190,524

MAGNETIC SEPARATORS

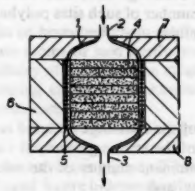
James H. P. Watson, St. Austell, England, assignor to English Clays Lovering Pochin & Co., Ltd., Cornwall, England

Filed Jul. 21, 1975, Ser. No. 597,686

Claims priority, application United Kingdom, Jul. 19, 1974, 32216/74

Int. Cl.² B03C 1/02

U.S. Cl. 209—213 **2 Claims**



1. In a magnetic separator for separating magnetizable particles from a fluid having such particles in suspension therein, the separator comprising a separating chamber having an inlet and an outlet for a fluid, a packing material which is pervious to the fluid disposed within the separating chamber between the inlet and the outlet, and electromagnetic means for establishing a magnetic field in the region of the packing material within the separating chamber, the improvement which comprises the packing material being paramagnetic at normal operating temperatures and normal operating magnetic field intensities, said chamber additionally being provided with a packing material, which is pervious to the fluid and which is ferromagnetic at normal operating temperatures and normal operating magnetic field intensities, disposed between the paramagnetic packing material and the outlet.

4,190,525

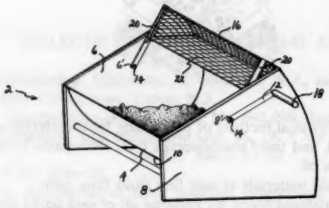
LITTER AND REFUSE RECEPTACLE AND SEPARATOR

Paul B. Menzel, 523 N. Euclid Ave., Pittsburgh, Pa. 15206

Filed Sep. 26, 1978, Ser. No. 945,920

Int. Cl.² B07B 1/00

U.S. Cl. 209—235 **3 Claims**



1. Apparatus for containment of a bed of litter material and for separation from said litter material of refuse deposited thereon, including:

a frame defining an open receptacle for the containment of litter and refuse,

a sifting screen member forming a concave scoop operatively connected for movement along a defined locus relative to said frame from an initial position above said litter bed, through said litter bed, and back to said initial position, whereby to traverse substantially the entire body of said litter bed and to sift accumulated refuse therefrom,

said screen member being detachable from said operative connection to said frame for disposal of the refuse sifted by said screen member.

4,190,526

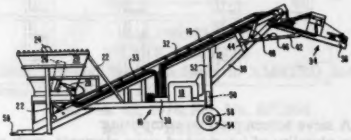
PORTABLE SCREENING PLANT

Ernest C. Bachand, Auburn, Mass., assignor to Pioneer Cover-All, Inc., North Oxford, Mass.

Filed Jan. 5, 1978, Ser. No. 867,272

Int. Cl.² B07B 1/42

U.S. Cl. 209—245 **5 Claims**



1. A portable screening plant comprising:

a support frame including an inclined conveyor support disposed in an inclined path;

an elongated endless loop conveyor belt disposed along said inclined path and extending between a lower supply end and an upper discharge end;

means mounted on said support frame and coupled to said conveyor belt for causing movement of the belt along said path;

a hopper attached to said support frame and disposed in a generally vertical disposition with its discharge end in association with the lower end of the conveyor belt and including a grizzly disposed over the upper supply end;

a plurality of wiper blades disposed within the hopper and each rotatably mounted for wiping contact with a respective hopper side wall;

hydraulic means coupled to the wiper blades and operative to cause rotatable reciprocating movement of the blades;

a wheel assembly attached to and supporting said support frame and operative to permit trailing of the plant;

said wheel assembly being attached to the support frame by telescoping members by which the support frame and conveyor belt can be raised to intended operating heights;

a shaker adjustably attached to the upper end of the support frame and capable of being disposed in a raised position to receive material discharged from the conveyor belt, and in a lowered position for stowage below the conveyor belt;

said shaker including:

a shaker screen;

a rigid frame pivotally connected at one end to said support frame near the upper end of said inclined conveyor support;

a linkage mechanism securing the shaker to the support frame and including a pair of articulated two section links each pivotally connected at one end to said support frame at a position below the pivotal connection of the shaker frame, and at the other end to the shaker frame at a position outward of the pivotal connection thereof to the support frame, each of said links being centrally hinged;

a pair of hydraulic actuators each interconnecting a respective one of said links and said support frame each pivotally

connected at one end to said support frame and at the other end to an associated link;

said hydraulic actuators being operative in a retracted position to retain said links in an open linear disposition to maintain the shaker in its raised operating position, and being operative in an extended position to cause folding of said links and downward pivoting of the shaker into its lowered position.

4,190,527
INTERLOCKING SCREEN ELEMENTS

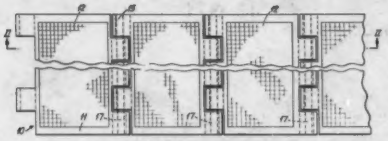
Clifford M. Spiller, The Smithy, Burghwallis, Doncaster, England

Filed Nov. 9, 1977, Ser. No. 850,104

Claims priority, application United Kingdom, Nov. 10, 1976, 46687/76

Int. Cl.² B07B *1/46*

U.S. Cl. 209—363 5 Claims



1. A sieve screen module comprising:

(i) a plurality of interlocked sieve elements, each sieve element having a rectangular parallelpiped body formed with through apertures to provide a mesh, opposed edges of said body having castellated formations arranged and dimensioned so as to be interdigitated with the complementary formations of the juxtaposed elements to provide a smooth joint, the underside of said formations being grooved to form together a continuous channel,

(ii) an elongate member extending along within said channel and a settable material contained in said channel which adheres to the elongate member and channel walls for locking said sieve elements together.

4,190,528
PROCESS FOR BIOLOGICAL PURIFICATION OF WASTE WATER

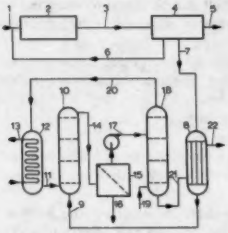
Bernardus H. N. Dassen, Kerkrade, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Jun. 20, 1978, Ser. No. 917,359

Claims priority, application Netherlands, Jun. 27, 1977, 7707081

Int. Cl.² C02C *1/06*

U.S. Cl. 210—8 8 Claims



1. Process for biological purification of waste water, in which a suspension of the activated sludge formed during the purification is hydrolyzed in a basic medium and at an elevated temperature, said process being conducted by giving the suspension a pH of between about 8 and about 11 and carrying out the hydrolysis in the presence of a volatile base selected from the group consisting of ammonia and ammonium carbonate at a temperature of between about 90° C. and about 300° C., to obtain a hydrolysate containing at least one of naturally occurring amino acids or oligopeptides, separating the hydrolysate from the suspension, expelling said volatile base from said hydrolysate, and returning said volatile base to adjust said pH.

4,190,529
MIXED-FORM POLYHALIDE RESINS FOR DISINFECTING WATER

Gary L. Hatch, Milwaukee, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Division of Ser. No. 920,260, Jun. 6, 1978, which is a continuation of Ser. No. 656,416, Feb. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 563,068, Mar. 28, 1975, abandoned. This application Feb. 2, 1979, Ser. No. 8,875

Int. Cl.² C02B *3/10*

U.S. Cl. 210—29 6 Claims

1. A method of disinfecting water containing bacteria, said method comprising:

(a) providing a quantity of a mixed-form polyhalide bactericidal resin comprising a strong base anion-exchange resin having anion exchange sites and having attached to a predominant number of such sites polyhalide anions of the following formulas:

$a(I_3^-)$ and $b(I_5^-)$

wherein:

a=0.4 to 0.8 of the exchange sites;

b=0.1 to 0.3 of the exchange sites;

a+b=a predominant number of the anion sites available for exchange; and

a+2(b) equals or exceeds 1.0;

(b) contacting the water to be disinfected with said resin at a flow rate controlled to permit killing of substantially all bacteria contained therein.

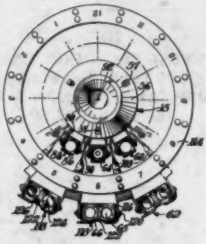
4,190,530
CENTRIFUGAL METHOD AND APPARATUS FOR PROCESSING FLUID MATERIALS

Jesse G. Forsythe, Jr., Media, Pa.; Donald R. Johnson, Wilmington, and Linda M. St. Onge, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1978, Ser. No. 892,508

Int. Cl.² B01D *15/06*

U.S. Cl. 210—31 R 31 Claims



23. A centrifugal method of processing fluid materials using first, second, and third unconnected fluid flow paths comprising the steps of:

placing said materials in said first fluid flow path,

using centrifugal force, by rotating all of said paths about a common axis in a first sense, to move said materials along said first flow path to one of said second and third flow paths, and

switching said materials from said first flow path to the other one of said second and third flow paths by angularly accelerating said first flow path differently than said second and third flow paths about said axis.

4,190,531

METHOD OF CONCENTRATING AND COLLECTING OIL SPILLS

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,674
Int. Cl.[2] C02B 9/02
U.S. Cl. 210—62 **2 Claims**

1. A method of concentrating, collecting and controlling oil spilled in water, which method comprises spreading around the periphery of said oil a liquid composition consisting essentially of

(a) from 0.1 to 95.0% of a fluorochemical of the formula

$$(R_f)_nTmZr$$

where n is 1 or 2;
m is 0 or 1;
r is 1 or 2;
R_f is a straight or branched chain perfluoroalkyl group of 1 to 20 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms, or said perfluoroalkyl containing at most one chlorine or hydrogen atom for every two carbon atoms;
T is a covalent bond, or a connecting group with a functionality of n+r for linking a maximum of 2 R_f groups and 2 Z groups, the connecting group T being R or $R_3(X—R_4)_p$ wherein R_3 and R_4 are independently straight or branched chain, saturated or unsaturated, or halo substituted, alkylene or arylene of up to 12 carbon atoms, X is thio, oxy or imino where the nitrogen in said imino is secondary or tertiary and p is 1 to 4;
Z is one or two neutral or polar groups selected independently from —$CONR_1R_2$, —OH, —CN, —$CONR_1COR_2$, —$SO_2NR_1R_2$, —O_2CR_1 and —CO_2R_1, where R_1 and R_2 are independently hydrogen, straight or branched chain alkyl or 1 to 12 carbon atoms or straight or branched chain alkyl of 1 to 12 carbon atoms substituted by one or more of —OH, —$COCH_3$ or —$CONHCH_3$, and where said R_f contains more than 6 carbon atoms Z may also be substituted by —CO_2H, —SO_3H, —$PO(OH)_2$, —OSO_3H, —S_2O_3Na or quaternary ammonium; with the proviso that said fluorochemical has a solubility in water less than 0.01% by weight;
(b) from 5 to 99.9% of a diluent in which said fluorochemical is at least 0.1% soluble and which diluent has a solubility in water greater than 0.01%; and
wherein said fluorochemical exhibits a persistent spreading pressure greater than 50 dynes/cm at less than 10 mg./sq. meter, such that said composition forms a durable, rapidly spreading, water insoluble surface film to contract, collect and control said oil.

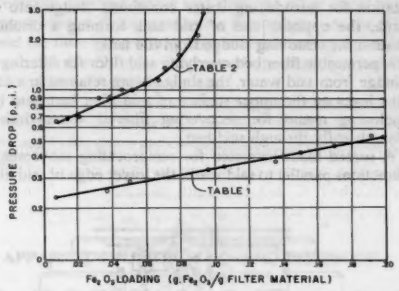
4,190,532

CHARGED FILTER AID MATERIAL AND ION EXCHANGE BED

Christopher J. Halbfoster, Greenbrook, N.J., assignor to Ecodyne Corporation, Union, N.J.

Continuation-in-part of Ser. No. 695,098, Jun. 11, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,319
Int. Cl.[2] B01D 37/02
U.S. Cl. 210—75 **27 Claims**

1. An improved filter material comprising: a mixture of cation exchange resin particles and treated filter-aid material, said mixture being capable of producing a clumping phenomenon said resin particles being in the size range of about 60 to 400 mesh, and said treated filter aid material being characterized by a negative surface charge prior to treatment, said filter aid material having been treated with an electrolyte-type compound that produces a positive surface charge by bonding thereon.



4,190,533

FILTER METHOD

Gene Hirs, Livonia, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Feb. 12, 1976, Ser. No. 657,666
Int. Cl.[2] B01D 23/24
U.S. Cl. 210—80 **1 Claim**

1. In a method of filtering contaminants from a liquid, the steps of:

flowing contaminated liquid through a deep bed filter comprised of at least two contiguous, vertically superimposed filter media layers, thereby accumulating contaminants within the interstices of the bed to achieve a clarified filtrate, the filter media of the uppermost of said layers (a) consisting essentially of hydrophilic, oleophobic granules substantially symmetrical and substantially uniform in size and shape to provide a porous entrance surface for the contaminated liquid, the granules having a uniformity coefficient of substantially about and not less than 1, wherein the uniformity coefficient is defined as the number obtained by dividing the sieve opening, in millimeters, which will pass sixty percent of the granules, by the sieve opening in millimeters which will pass just ten percent of the granules, and (b) having a specific gravity in the range of between about 1.05 and about 1.4;

terminating the flow of contaminated liquid after the filter has become at least partially clogged by accumulated contaminants;

rejuvenating the deep bed filter by flowing backwash liquid upwardly through the bed to expand both layers substantially in situ to remove accumulated contaminants, the specific gravity of the uppermost of the layers facilitating expansion for the removal of contaminants; and

reforming the bed with substantially distinct layers subsequent to the backwashing step and achieving an entrance surface in the uppermost of said layers having a porosity substantially the same as the porosity of said surface prior to the filtration cycle.

4,190,534

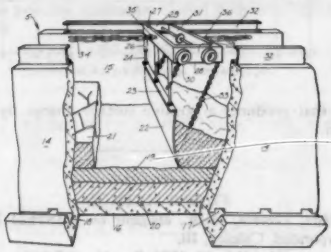
WASTE WATER FILTRATION AND SLUDGE REMOVAL SYSTEM

Everette L. Wyatt, Carthage, Mo., assignor to Armco Steel Corporation, Middletown, Ohio

Filed May 8, 1978, Ser. No. 903,781
Int. Cl.[2] B01D 23/24
U.S. Cl. 210—80 **13 Claims**

1. A waste water filtration and sludge removal system for filtering and removing sludge materials suspended in water comprising:

(a) A trough-like filtering tank having a pair of spaced upstanding longitudinal walls supported by a substantially planar imperforate floor, one end of said tank forming a charging station for introducing water containing sludge into said tank, the opposite end of said tank forming a discharge station for removing sludge from the tank;
(b) A permeable filter bed overlying said floor for filtering the sludge from said water, the sludge being retained in a cake-like layer on the upper surface of said filter bed, said tank including means for recovering filtered water draining downwardly through said bed;
(c) A screed blade mounted for reciprocating movement in directions parallel to said walls, the lower edge of said blade



being positioned to just contact the upper surface of said filter bed for removing the sludge layer deposited thereon with minimal disturbance of said upper surface of said filter bed; and
(d) Means for moving said screed blade in a forward direction toward said discharge station to move the sludge to the discharge station, and in a reverse direction away from said discharge station to return said blade for another scraping operation, said blade producing minimal disturbance of the sludge layer when moving in said reverse direction, said discharge station including an opening therein of sufficient dimensions to permit facile passage therethrough of sludge being discharged from said opening.

4,190,535

MEANS FOR SEPARATING LYMPHOCYTES AND MONOCYTES FROM ANTICOAGULATED BLOOD

Albert A. Luderer, Corning; Gerald Odstrchel, Horseheads, and Anthony R. Zine, Jr., Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 881,252, Feb. 27, 1978, abandoned. This application Jul. 10, 1978, Ser. No. 922,825
Int. Cl.[2] B01D *31/26*
U.S. Cl. 210—83 **29 Claims**

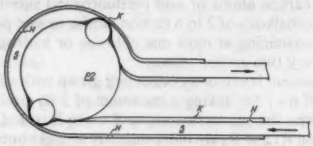
8. A method for separating platelets, lymphocytes, and monocytes from anticoagulant blood comprising the steps:
(a) a water-insoluble thixotropic gel-like substance which is chemically inert to blood constituents and having a specific gravity between 1.065–1.077 g/cc is placed in a sample of anticoagulated blood;
(b) the gel-blood sample is centrifuged at a force of at least 1200 G's for a sufficient length of time to cause the gel-like substance to form a barrier between the plasma, platelets, lymphocytes and monocytes and the heavier blood cells;
(c) the plasma is removed from atop said barrier leaving said platelets, lymphocytes and monocytes resting thereupon;
(d) a buffer solution compatible with platelets, lymphocytes, and monocytes, inert to the gel-like substance, and having a specific gravity less than that of the gel-like substance is deposited upon said barrier;
(e) the buffer solution is agitated to cause the said platelets, lymphocytes, and monocytes to become suspended therein; and then
(f) the suspension of platelets, lymphocytes, and monocytes in buffer is removed from contact with said barrier.

4,190,536

PERISTALTIC PUMPING MEANS FOR BLOOD DIALYSIS

Lars Grimsrud, Salmon, Id., assignor to A/S Nycotron, Drammen, Norway

Filed Feb. 22, 1978, Ser. No. 880,156
Claims priority, application Norway, Feb. 23, 1977, 770605
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—93 **2 Claims**



1. Dialysis apparatus for regulated blood dialysis comprising a dialyzer having flow passages for blood and dialysate, respectively, separated by semipermeable barriers for transferring liquid from the blood to the dialysate, the blood and dialysate being driven through their respective flow passages by individually associated pumping means, the improvement wherein said pumping means for the dialysate comprise two peristaltic pumps mounted on a common shaft and having the same pumping capacity and being respectively disposed on the inlet and outlet sides of said flow passage for dialysate through the dialyzer, one of said pumps being connected between a dialysate source and the inlet of the flow passage for dialysate through the dialyzer, the other of said pumps being connected between the outlet of said flow passage and a dialysate discharge conduit, a peristaltically actuated hose section of the peristaltic pump on the outlet side of the dialysate flow passage being surrounded by a sealed jacket having an interior in open communication with the interior of said hose section, and a tap outlet connected with means for gauging the amount of tapped liquid being arranged in communication with said flow passage between said two pumps.

4,190,537

WATER STORAGE CONTROL FOR REVERSE OSMOSIS SYSTEM

Raymond A. Tondreau, San Marcos, and Donald T. Bray, Escondido, both of Calif., assignors to Desalination Systems, Inc., Escondido, Calif.

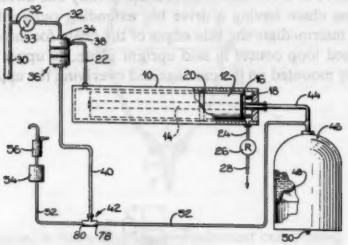
Filed Dec. 21, 1977, Ser. No. 862,860
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—98 **8 Claims**

1. Reverse osmosis apparatus comprising a pressure resistant container housing a semipermeable membrane; means for introducing a solute-containing feed water into said pressure resistant container under elevated pressure; means for releasing high solute content concentrate from said pressure resistant container while maintaining operating pressure therein; means

for collecting permeate separated from said feed water by transport through said semipermeable membrane and for storing said permeate in a storage tank under elevated pressure; and a dispensing device connected to said storage tank for dispensing said permeate therefrom; in which the improvement comprises:

a. an automatic valve in said means for introducing said solute-containing feed water into said pressure resistant container;

b. control means for closing said automatic valve when the pressure in said storage tank rises above a first predetermined pressure and for opening said automatic valve when the pressure in said storage tank falls below a second predetermined pressure below said first predetermined pressure, said control means being actuated by the liquid pressure in a sensing conduit between said valve and the interior of said storage tank; and,



c. a constricted passageway device comprising; a tubular body, having an inlet end connected to said storage tank and an outlet end connected to said dispensing device, a section of reduced internal diameter in said body, and a section of expanded internal diameter on the downstream side of said section of reduced internal diameter, to produce a lowered pressure throat section in said tubular body when said permeate flows through said tubular body from said inlet end to said outlet end, said lowered pressure throat section of said tubular body communicating with said sensing conduit whose contained liquid pressure actuates said control means for said automatic valve;

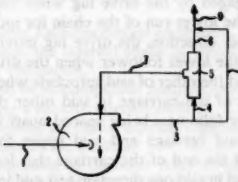
d. whereby opening said permeate dispensing device to dispense permeate from said storage tank causes flow of said permeate through said constricted passageway device causing temporary reduction of pressure in said sensing conduit and servo opening action of said automatic valve.

4,190,538

PUMP SEAL FLUSH

Carl Chen, Newark, Del., assignor to E. I. Du Pont de Nemours And Company, Wilmington, Del.

Filed Sep. 22, 1978, Ser. No. 945,062
Int. Cl.[2] B01D *25/08, 25/32, 29/20, 35/02*
U.S. Cl. 210—167 **2 Claims**



1. Apparatus for flushing a pump seal comprising

(i) a pump having a mechanical seal,

(ii) the discharge line of said pump being connected to an inertial filter, said filter comprising an impervious shell having an inlet and two outlets, the inlet and one outlet being connected by a cylindrical porous filter element centrally disposed within said shell, the other outlet communicating with an annulus for filtrate between the shell and the filter element, the filter element having a porosity such that the filtrate will be essentially solids free and the filter element self-cleaning, and

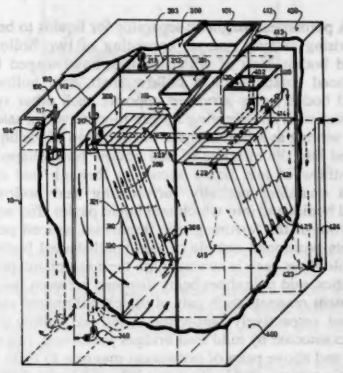
(iii) the filter having two discharge lines connected to the outlets, the discharge line for filter filtrate being connected to the pump and communicating to the mechanical seal.

4,190,539

APPARATUS FOR ON-SITE RENOVATION OF SANITARY WATERS

Ferdinand Besik, 3243 Chokecherry Crs., Mississauga, Ontario, Canada (L5L 1B1)

Filed Aug. 16, 1978, Ser. No. 934,255
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—195.4 **6 Claims**



1. A self contained apparatus for renovation of sanitary waters comprising a waste water receiving tank divided by common partitions into three bioreaction chambers, means for flowing waste water into the first bioreaction chamber, said bioreaction chambers being in communication via restricted openings in said common partitions for flowing the waste water by gravity from chamber to chamber in the direction from first chamber into the third chamber, said bioreaction chambers being also equipped wih an opening in said common partitions for recirculating a portion of the content from said third bioreaction chamber, will all bioreaction chambers being equipped with submerged mechanical mixers for recirculating, mixing and aerating the contents therein to maintain optimum process conditions, said third bioreaction chamber in addition being equipped with a suspended solids separator for separation of suspended solids from the thusly treated waste water and for retaining the separated suspended solids in said third bioreaction chamber, said suspended solids separator being composed of number of parallel settling channels completely submerged in the content in said third bioreaction chamber, said settling channels each being equipped with an opening located in the side wall at the bottom of the chamber and a restricted opening at the top for flowing the treated waste water upwardly through said settling channels and out through said restricted opening into a horizontally positioned effluent collection pipe, means for chemical treatment, a purification chamber and an exit pipe for discharge of treated effluent out of the apparatus.

4,190,540

PERMANENT MAGNETIC SEPARATOR FOR LIQUIDS

Heinrich Spodig, 4714 Selm-Bork, Netteberge 202, Fed. Rep. of Germany

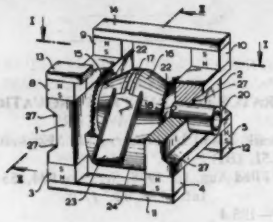
Filed Dec. 27, 1977, Ser. No. 825,690

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637802

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.[2] B01D *35/06*

U.S. Cl. 210—222 6 Claims



1. A permanent magnetic separator for liquids to be purified comprising at least one set consisting of two hollow bowl-shaped bodies each of which hollow bowl-shaped bodies is positioned rotatably on a hollow shaft, said hollow bowl-shaped bodies being arranged opposite each other symmetrically and with an operating air gap therebetween, said hollow shafts serving as inflows for the introduction of the liquid to be purified into the interiors of said hollow bowl-shaped bodies, the outflow of said liquid occurring through said operating gap, a container partially surrounding said hollow bowl-shaped bodies and into which said liquid passes after separation therefrom of the ferromagnetic impurities, spaced permanent magnets positioned outside of said bowl-shaped bodies, separate pole shoes each in contact with their associated permanent magnetics, said pole shoes being disposed between two pairs of permanent magnets each pair of which permanent magnets is disposed, respectively, below and above said hollow shafts and being connected by mild iron bridges positioned, respectively, below and above pairs of permanent magnets to form a closed magnetic system, said hollow bowl-shaped bodies being oppositely polarized, said pole shoes carrying said hollow shafts, said ferromagnetic impurities being collected from the liquid to be purified in said operating air gap and on and adjacent to the edges of said hollow bowl-shaped bodies, and a stripper associated with said operating air gap to remove said ferromagnetic impurities during rotation of said hollow bowl-shaped bodies for discharge and removal of said ferromagnetic impurities.

4,190,541

WASTE WATER TREATMENT APPARATUS

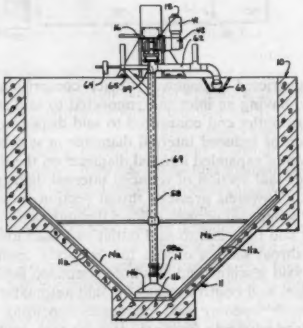
Thomas B. Wade, Poplar Grove, and James A. Knight, Pearl City, both of Ill., assignors to Aqua-Aerobic Systems, Inc., Rockford, Ill.

Filed Jan. 18, 1979, Ser. No. 4,376

Int. Cl.[2] B01D *21/24*

U.S. Cl. 210—241 12 Claims

12. In a waste water treatment apparatus including a tank having an open top and fluid inlet and fluid outlet means communicating with the tank, a generally horizontal carriage support rail extending across the top of the tank, a carriage mounted in the rail for movement therealong over the top of the tank, tank cleaning means mounted on the carriage and extending downwardly from the carriage into the tank for movement with the carriage along the tank, carriage drive means including a drive motor and an endless chain entrained over a pair of sprockets having upper and lower runs generally paralleling the carriage support rail, and means connecting the carriage to the chain for movement thereby back and forth along the carriage support rail, the improvement wherein said carriage support rail comprises a box-shaped beam having a top wall and spaced side walls extending downwardly from the top wall and a pair of inwardly extending carriage support flanges on the side walls spaced apart to define a track opening therebetween, means mounting said sprockets inside the box-shaped beam adjacent its ends to support said chain inside the beam with the upper and lower runs of the chain extending lengthwise of an upright plane substantially medially between the spaced side walls of the beam, said carriage including a pair of laterally spaced wheel mounting members extending inside said box-shaped beam at relatively opposite sides of said endless chain, and at least one wheel mounted on each of said wheel mounting members inside said beam and in rolling engagement with the upper side of a respective one of the carriage support flanges on the box-shaped beam to support the carriage for movement along the beam, said drive means being operative to drive said endless chain in only one direction, said endless chain having a drive lug extending outwardly therefrom intermediate the side edges of the chain for movement in a closed loop course in said upright plane, an upper follower rigidly mounted on the carriage and overlying the upper run of



said chain to be engaged by the drive lug when the drive lug is moving along the upper run of the chain for moving the carriage in one direction, the drive lug moving out of engagement with the upper follower when the lug moves downwardly over one of said sprockets whereby to interrupt movement of the carriage in said one direction, a lower follower rigidly mounted on the carriage and underlying the lower run of the chain to be engaged by the drive lug when the drive lug is moving along the lower run of the chain for moving the carriage in the other direction, the drive lug moving out of engagement with the lower follower when the drive lug moves upwardly around the other of said sprockets whereby to interrupt movement of the carriage in said other direction, said upper and lower followers being spaced apart in a direction lengthwise of said carriage and said upper follower being located adjacent the end of the carriage that leads when the carriage is moved in said one direction and said lower follower being located adjacent the end of the carriage that leads when the carriage is moved in said other direction, and chain guide means underlying the upper run of said chain means and overlying the lower run of said chain means.

4,190,542

DISPOSABLE COLUMN

Martin E. Hodgson, Harlow; Graham D. Munro, Buntingford; David P. Rickman, Ware, and Jack Fennimore, Welwyn, all of England, assignors to Smith & Nephew Research Ltd., Harlow, England

Continuation of Ser. No. 491,329, Jul. 24, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 677,826

Claims priority, application United Kingdom, Jul. 26, 1973, 35678/73

Int. Cl.² B01D *27/02*

U.S. Cl. 210—282 10 Claims

1. Disposable haemoperfusion equipment comprising:

(A) a column,

(i) formed in biocompatible synthetic polymer material,

(ii) having a smooth internal surface,

(iii) enclosing perforate internal support means towards each end of said column

(iv) diminishing in diameter from a maximum diameter intermediate said ends, and then

(v) converging smoothly at each end of said column to an inlet port and an outlet port respectively, each such port defining a minimal dead space between itself and the nearer support means,

(vi) said column having a length to maximum diameter ratio of 1.5:1 to 5:1 and an internal volume of 50 to 800 ml., and

(vii) said column being formed as two identical halves located end to end, each half possessing a first frusto-conical tapering portion having an included angle of from 10° to 30°, and a second frusto-conical tapering portion, integral with said first portion, but of an included angle of from 50° to 70°, tapering to a liquid flow connection at each end of said column;

(B) a body of absorbtive particulate material,

(i) substantially filling the column and held between the support means so that the particles do not move relatively in use, and

(ii) consisting of particles having a smooth biocompatible surface; and

(C) a biocompatible liquid charge filling the column, chosen from the group of degassed isotonic saline and plasma extender.

10. Disposable haemoperfusion equipment, comprising:

(A) a column, the internal shape of which is that of a trochoid of revolution,

(i) formed in biocompatible synthetic polymer material,

(ii) having a smooth internal surface,

(iii) enclosing perforate internal support means towards each end of the column,

(iv) diminishing in diameter from a maximum diameter intermediate said ends, and then

(v) converging smoothly at each end of said column to an inlet port and an outlet port respectively, each such port defining a minimal dead space between itself and the nearer support means,

(vi) said column having a length to maximum diameter ratio of 1.5:1 to 5:1 and an internal volume of 50 to 800 ml;

(B) a body of absorbtive particulate material,

(i) substantially filling the column and held between the support means so that the particles do not move relatively in use, and

(ii) consisting of particles having a smooth biocompatible surface; and

(C) a biocompatible liquid charge filling the column, chosen from the group of degassed isotonic saline and plasma extender.

4,190,543

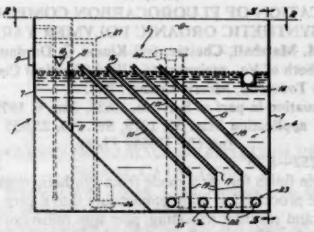
WASTE WATER TREATMENT APPARATUS

Jerard M. Pederson, 3502 Clifton Ave., Cincinnati, Ohio 45220, and William J. Beckman, Jr., 1722 Fireside Dr., Cincinnati, Ohio 45230

Filed Jul. 19, 1978, Ser. No. 926,073

Int. Cl.² B01D *29/04*

U.S. Cl. 210—332 6 Claims



1. Waste water treatment apparatus for removing suspended solids from waste water comprising in combination:

at least one filtration chamber, said chamber having a plurality of walls including bottom and side walls, said filtration chamber also having waste water receiving and discharging means,

a plurality of wedge wire media panels mounted within said filtration chamber, said panels having perforations therein through which the waste water is directed, said media panels extending from approximately the bottom wall of said filter chamber to the normal waste water surface level and extending between the side walls, and said media panels being inclined with respect to the vertical axis of the side walls such that the portion of the media panel adjacent to said bottom wall is closer to the discharging means than is the portion of the media panel adjacent to said waste water surface level, whereby a biological mat is established on and adjacent to the media panels so as to filter the solids by adsorption.

4,190,544

FILTER ELEMENT FOR A ROTATABLE DISC FILTER

Ferdinand Schnellmann, Jona, and Hanspeter Meier, Rapperswil, both of Switzerland, assignors to Chemap A.G., Männedorf, Switzerland

Continuation of Ser. No. 874,906, Feb. 3, 1978, abandoned. This application Nov. 30, 1978, Ser. No. 964,939

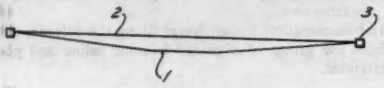
Claims priority, application Switzerland, Feb. 23, 1977, 2247/77

Int. Cl.² B01D *33/28*

U.S. Cl. 210—461 8 Claims

1. In combination with a pressure disc filter of the type in which media to be filtered corrodes metal upon contact therewith, a filter element comprising a metallic filter plate having upper and lower surfaces and being subject to corrosion upon contact with the media to be filtered, said filter plate having a center outlet; a coating covering said surfaces except said

outlet and being at least resistant to corrosion on contact with the media to be filtered, said coating having an upwardly facing surface having a plurality of rectangular, substantially equally dimensioned and evenly spaced projections each extending upwardly from the upwardly facing surface to thereby



provide a plurality of vertical channels all of which extend radially to said outlet and through which filtrate is drained directly into the outlet; and a filter cloth at least partially overlying said coating and being supported on said projections, so that filtrate passes through said filter cloth onto said coating without coming into contact with said metallic filter plate.

4,190,545

APPLICATION OF FLUOROCARBON COMPOUND TO SYNTHETIC ORGANIC POLYMER YARN

Robert M. Marshall, Chester, and Kimon C. Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 1,625, Jan. 8, 1979. This application Mar. 30, 1979, Ser. No. 25,635

Int. Cl.[2] D06M *13/34*

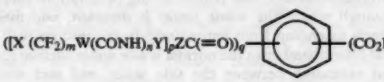
U.S. Cl. 252—8.75 **27 Claims**

1. A spin finish for yarn, made from synthetic organic polymer, to be processed at high temperature into a yarn that is oil repellent and resistant to soiling, said spin finish comprising:

a. about 5 to 25 percent by weight of said spin finish of a first noncontinuous phase consisting essentially of

i. about 15 to 80 weight percent of a nonhomogeneous mixture of a salt of dinonyl sulfosuccinate, a salt of dimethyl naphthalene sulfonate, and ammonium perfluoroalkyl carboxylate, and

ii. about 20 to 85 weight percent of a fluorochemical compound having the formula



wherein the attachment of the fluorinated radicals and the radicals CO_2B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus; wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; $(CF_2)_m$ and "Y" have each at least 2 carbon atoms in the main chain; "Z" is oxygen and p is 1, or "Z" is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH_2RCHOH or is $CH_2RCHOCH_2RCHOH$ where "R" is hydrogen or methyl, or "B" is $CH_2CH(OH)CH_2Q$ where Q is halogen, hydroxy, or nitrile; or "B" is $CH_2CH(OH)CH_2OCH_2CH(OH)CH_2Q$; and r is an integer of at least 1 but not greater than q; and $X(CF_2)_m$, W and Y are straight chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different;

b. about 50 to 90 percent by weight of said spin finish of water; and

c. about 5 to 25 percent by weight of said spin finish of a second noncontinuous phase which is capable of being emulsified with said first noncontinuous phase and said water without separation of any of the component parts of said spin finish.

4,190,546

TRACTION FLUID

Stanley Kulik, Hawley, near Camberley, and Anthony M. Smith, Ashford, both of England, assignors to The British Petroleum Company Limited, Middlesex, England

Filed Jul. 20, 1978, Ser. No. 926,233

Claims priority, application United Kingdom, Aug. 27, 1977, 36091/77

Int. Cl.[2] C10M *1/50, 1/16, 1/20*

U.S. Cl. 252—49.6 **5 Claims**

1. A traction fluid comprising from 50 to 90% wt of a naphthenic hydrocarbon or mixture of naphthenic hydrocarbon which is one or more alkylated dicyclohexyl methanes, from 8 to 40% wt of a silicone fluid and from 2 to 10% wt of a co-solvent which is an aromatic hydrocarbon or aromatic ether which ensures complete miscibility between the naphthenic hydrocarbon and silicone fluid, the percentages being by weight of the three components.

4,190,547

NON-FLAMMABLE INSULATING MATERIAL

Harald Mahnke; Jürgen Nieberle, both of Ludwigshafen; Volker Trautz, Neckarhausen, and Heinz Weber, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,193

Int. Cl.[2] C04B *43/02*

U.S. Cl. 252—62 **2 Claims**

1. Non-flammable insulating material having good fire resistance and a density of from 80 to 230 g/l, which material comprises

(A) from 99 to 80% by weight of expanded perlite or vermiculite having a mean particle diameter of from 0.05 to 3 mm and a bulk density of from 30 to 150 g/l and

(B) from 0 to 40% by weight of inorganic additives, selected from the group consisting of glass fibers, rockwool, mineral wool, talc and gypsum, the particles being bonded to one another by

(C) from 1 to 20% by weight of a heat-resistant organic high molecular weight binder, selected from the group consisting of crosslinked melamine/formaldehyde and phenol/-formaldehyde resins,

wherein the insulating material contains, as an additional binder 0.2 to 4% by weight, based on the mixture, of an alkylphenol/phenol/formaldehyde condensate C'.

4,190,548

PLASTIC BONDED PERMANENT MAGNET AND METHOD OF MAKING SAME

Max Baermann, Postfach 26, 5060 Bergisch Gladbach 1, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 925,966

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736642

Int. Cl.[2] H01F *1/06*

U.S. Cl. 252—62.54 **9 Claims**

1. In a plastic bonded permanent magnet including particles of a cobalt-rare earth alloy permanent magnet material dispersed within a plastic binder, the improvement comprising: said binder being a substantially oxygen free plastic.

4,190,549

SOAP FOR SCOURING PAD

Tetsuya Imamura, and Takashi Hiraide, both of Tokyo, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1978, Ser. No. 961,214
Claims priority, application Japan, Dec. 26, 1977, 52/156948
Int. Cl.[2] A47L 17/08; C11D 9/02, 17/04
U.S. Cl. 252—91 5 Claims

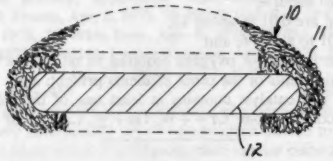
1. A soap-filled steel wool scouring pad in which the soap consists essentially of neutralized alkali metal salt of fatty acid, said fatty acid having an average carbon number of 16 to 20 and an iodine value of 30 to 45, the degree of neutralization of said fatty acid with the alkali metal being from 85 to 98% by weight.

4,190,550

SOAP-FILLED PAD

Douglas D. Campbell, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 397,345, Sep. 14, 1973, abandoned. This application Dec. 14, 1977, Ser. No. 860,332
Int. Cl.[2] C11D 17/00
U.S. Cl. 252—93 6 Claims



1. A seamless, fibrous soap-filled pad, having particular utility in imparting a cleansing and mildly stimulating rubbing action to human skin, comprising in combination:

a seamless edgeless continuous envelope of needled crimped, resilient, stretchy synthetic organic fibers which are at least about 3 cm long and have about 2 to about 10 crimps per cm,

said envelope surrounding a core of solid, surfactant material, the thickness of the envelope wall lying outward from said core being at least about 5 mm, and being held in integral form solely by the needled inter-entanglement of said fibers.

said pad being of a size capable of being readily held in the palm of the user.

4,190,551

GRANULAR OR POWDERY DETERGENT COMPOSITION OF HIGH FLUIDITY

Moriyasu Murata, and Fumio Sai, both of Chiba, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,221
Claims priority, application Japan, Jun. 14, 1977, 51/70358
Int. Cl.[2] C11D 1/72, 7/02, 17/06
U.S. Cl. 252—99 24 Claims

1. A non-sticky dry powder consisting essentially of particles of water-insoluble, amorphous, phosphorus-containing alkali metal aluminosilicate having the formula

$$X(M_2O).Al_2O_3.Y(SiO_2).Z(P_2O_5).\omega(H_2O)$$

wherein M is Na or K; X, Y and Z are mole numbers satisfying the relations

$0.20 \leqq X \leqq 1.0$

$0.20 \leqq Y \leqq 4.00$

$0.001 \leqq Z \leqq 0.80$

and ω is zero or an optional positive number, said particles having adsorbed thereon water-soluble, synthetic, nonionic surface active agent, said powder containing from 1 to 75 wt. % of said nonionic surface active agent.

4,190,552

PASSIVATION OF METALS ON CRACKING CATALYSTS WITH AN ANTIMONY TRIS (HYDROCARBYL SULFIDE)

Brent J. Bertus; Dwight L. McKay, and Harold W. Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 25, 1978, Ser. No. 926,697
Int. Cl.[2] C10G 9/16, 11/06; C07F 9/90
U.S. Cl. 252—411 R 7 Claims

1. A method for passivating a contaminating metal upon a hydrocarbon cracking catalyst, which comprises contacting said cracking catalyst with an antimony tris (hydrocarbyl sulfide) to add the same thereto.

4,190,553

REJUVENATION OF DAMAGED ZEOLITE-SUPPORTED METAL CATALYSTS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 470,868, May 17, 1974, abandoned. This application Oct. 5, 1978, Ser. No. 948,890
Int. Cl.[2] B01J 29/38, 29/12, 29/22; C10G 13/10
U.S. Cl. 252—412 12 Claims

1. A method for rejuvenating a catalyst comprising about 0.1–3 wt.% of a non-zeolitic Group VIII noble metal supported on a siliceous zeolite carrier having an ion exchange capacity of at least about 0.1 meq/g, and wherein at least about 50% of the original zeolitic metal content of said zeolite carrier has been replaced with hydrogen ions and/or polyvalent metal ions, but which still contains some zeolitic sodium and/or magnesium ions, said catalyst having been previously subjected to thermal and/or hydrothermal conditions resulting in a maldistribution of said Group VIII noble metal on said carrier with resultant reduction in hydrogenation activity and in a deleterious migration of said zeolitic sodium and/or magnesium cations resulting in a reduction in cracking activity, which comprises:

(A) contacting said catalyst in an oxidized or sulfided state with a volumetric excess of a reagent consisting essentially of a 0.1–30 weight-percent aqueous ammonium hydroxide solution, and correlating the contacting time with the temperature and reagent strength so as to effect a substantial improvement in hydrogenation activity of said catalyst while retaining therein at least about 90 percent of said Group VIII noble metal;

(B) exchanging out a measurable portion of said zeolitic sodium and/or magnesium ions by adding an acid component to said ammonium hydroxide solution while said solution remains in contact with said catalyst, said acid component being added in an amount such that said catalyst is contacted with an extractive proportion of an aqueous ammonium salt solution having a pH below about 8;

(C) separating the catalyst from the resulting ammonium salt extract of zeolitic metal cations; and

(D) drying and calcining the separated catalyst at temperatures in the range of about 500°–950° F. while maintaining water vapor partial pressures below about 10 psi.

4,190,554

METHOD FOR REACTIVATION OF PLATINUM GROUP METAL CATALYST WITH AQUEOUS ALKALINE AND/OR REDUCING SOLUTIONS

Kiaki Yamauchi; Yukihiko Morimoto; Toshikatu Sasaki, and Katsumi Nakai, all of Osaka, Japan, assignors to Osaka Gas Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 861,521, Dec. 16, 1977, Pat. No. 4,147,660. This application Dec. 26, 1978, Ser. No. 972,868

Claims priority, application Japan, Dec. 22, 1976, 51/155512; Feb. 15, 1977, 52/15635; Apr. 25, 1977, 52/48285; Apr. 25, 1977, 52/48286; Apr. 27, 1977, 52/49507

Int. Cl.[2] B01J *23/96, 29/38;* C10G *13/10*

U.S. Cl. 252—412 11 Claims

1. A method for reactivation of a platinum group metal catalyst which comprises contacting a platinum group metal catalyst lowered in the catalytic activity as the result of having been used for hydro-cracking of hydrocarbons or alkanols with an aqueous solution of an inorganic alkaline compound of alkali metal or alkaline earth metal or mixtures thereof in a concentration of 0.001 to 10 N at a temperature of 5° to 250° C. until the catalytic activity of the catalyst is substantially recovered.

6. A method for reactivation of a platinum group metal catalyst which comprises contacting a platinum group metal catalyst lowered in the catalytic activity as the result of having been used for hydro-cracking of hydrocarbons or alkanols with an aqueous solution of a reducing substance in a concentration of 0.01 to 10% by weight at a temperature of 5° to 250° C. until the catalytic activity of the catalyst is substantially recovered.

4,190,555

CATALYST SYSTEM FOR POLYMERIZING ALPHA-OLEFINS AND METHOD OF MAKING SAME

Yoshinori Takamura, Otake; Hakusei Hamada, Nerima; Kiyoyuki Kitamura, Otake; Tetsuro Inada, Otake; Kunio Kodama, Otake, and Katuyuki Usami, Otake, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 27, 1977, Ser. No. 762,843

Claims priority, application Japan, Feb. 5, 1976, 51-10805

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B 19 Claims

1. A method of preparing an activated titanium component for use in an α-olefin polymerization catalyst system having at least one organo-aluminum compound admixed therein, said method comprising:

(a) reacting at a temperature in the range of 50°–200° C. and in the presence of an aromatic compound selected from aromatic hydrocarbons and halogenated aromatic hydrocarbons

(i) a titanium compound having the general formula $TiX_n(OR)_{4-n}$, wherein X is a halogen, R is a hydrocarbon group radical and n is 2 to 4,

(ii) a metal selected from the class consisting of groups II and III of the Periodic Table and present in the reaction in a molar amount of from 0.5 to 20 times the moles of the titanium compound, and

(iii) at least one halide of a metal selected from the class consisting of groups II and III of the Periodic Table and present in the reaction in a molar amount of from 0.5 to 20 times the moles of the titanium compound;

(b) treating the thus obtained reaction product with 0.1–20 moles of an organic compound selected from hydrocarbyl and chlorohydrocarbyl ethers, ketones and esters per mole of product at a temperature in the range of −50° to 150° C.;

(c) further treating the thus treated reaction product with 0.1–20 moles of a tetrahalide of a metal selected from the group consisting of titanium, vanadium and mixtures thereof, per mole of product at a temperature in the range of −80° to 80° C.; and

(d) aging the thus further treated reaction product at a temperature greater than 30° C. for a time ranging from 30 minutes to 24 hours.

4,190,556

PRODUCTION OF UNSATURATED NITRILES USING CATALYSTS PROMOTED WITH VARIOUS METALS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Macedonia, and Arthur F. Miller, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 380,527, Jul. 19, 1973, abandoned. This application Aug. 1, 1977, Ser. No. 821,033

Int. Cl.[2] B01J *21/02, 27/14, 23/84, 23/64*

U.S. Cl. 252—432 9 Claims

1. A catalyst having the following formula:

$$X_aA_bD_cFe_dBi_eMo_{12}O_x$$

wherein

X is Ge, Ag, Cr, Ru, Ti, W or mixture thereof;

A is an alkali metal, alkaline earth metal, rare earth metal, Nb, Ta, Tl, P, As, B, Sb or mixture thereof;

D is Ni, Co, Mg, Mn, Zn, Cd or mixture thereof;

wherein

a is 0.01 to about 4;

b is 0 to about 4;

c and d are 0.01 to about 12;

e is 0.01 to about 6; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present; and

wherein said catalyst contains at least one of the following element combinations: Cr++W, Ge+W, Cr+P and Ge+P.

4,190,557

ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 883,115, Mar. 3, 1978, Pat. No. 4,137,153, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application Aug. 10, 1978, Ser. No. 932,575

The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.

Int. Cl.[2] B01J *27/08, 27/10, 23/64*

U.S. Cl. 252—441 20 Claims

1. A catalytic composite comprising the pyrolyzed reaction product of a catalytically effective amount of a rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the pyrolysis of said carbonyl component, and of a zinc component.

4,190,558

CATALYSTS FOR PREPARING AROMATICS FROM SYNTHESIS GAS

Walter H. Seitzer, West Chester, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Division of Ser. No. 890,331, Mar. 27, 1978, Pat. No. 4,139,550, which is a continuation-in-part of Ser. No. 722,292, Sep. 10, 1976, abandoned. This application Oct. 10, 1978, Ser. No. 949,490

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z 5 Claims

1. A catalyst composition useful for converting CO and hydrogen to aromatic fuel mixtures comprising a copper-chromium promoted iron catalyst in admixture with type Y molecular sieve having a sodium cation content of less than about 0.2 wt.%, an SiO_2/Al_2O_3 weight ratio of less than about 6.0, and an NH_4O content of less than about 4 wt.%, wherein the volume ratio of iron catalyst to molecular sieve is about 0.1 to 10.0.

4,190,559

METAL CATALYST SUPPORT HAVING RECTANGULAR CROSS-SECTION

William B. Retallick, West Chester, Pa., assignor to Oxy-Catalyst, Inc., West Chester, Pa.

Filed Oct. 13, 1978, Ser. No. 951,980
Int. Cl.[2] B01J 35/02
U.S. Cl. 252—477 R 9 Claims

1. A metal catalyst support comprising:
a. a stack of metal strips;
b. said strips having indentations of uniform height, wherein the spacing between said strips is equal to said height; and
c. wherein said indentations are spaced along said strips in a varying, non-repetitive pattern, wherein the indentations in adjacent strips cannot coincide and nest together.

4,190,560

PROCESS FOR PREPARING CATALYST ON CARRIER SYSTEMS

John W. Geus, and Leonardus A. M. Hermans, both of Utrecht, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 894,612, Apr. 6, 1978, abandoned. This application May 19, 1978, Ser. No. 907,777
Claims priority, application Netherlands, Apr. 6, 1977, 7703762; France, Apr. 5, 1978, 78 10060; Fed. Rep. of Germany, Apr. 6, 1978, 2814914; Italy, Apr. 5, 1978, 48750A/78; Japan, Apr. 5, 1978, 53-40163; United Kingdom, Apr. 3, 1978, 12945/78
Int. Cl.[2] B01J 29/10, 23/62
U.S. Cl. 252—459 14 Claims

1. In a process for the preparation of a particulate, at least inchoately catalytically active composition affixed to the surface of a finely divided solid particulate carrier material by the steps of

forming an aqueous medium initially containing said carrier material homogeneously suspended in an aqueous solution of

at least one water soluble compound of at least one metal capable of forming said catalytically active composition, which will form a water insoluble compound of said metal upon an increase of the hydroxyl ion concentration in said aqueous medium, and a hydrolzable agent which upon heating will develop hydroxyl ions in said aqueous medium,

heating and stirring said aqueous medium so as to gradually and homogeneously increase the hydroxyl ion concentration throughout said aqueous medium thereby effecting the precipitation of said water insoluble compound substantially homogeneously onto said carrier material, separating said carrier material, having said water insoluble compound deposited thereon, from the remaining aqueous solution of said aqueous medium,

the improvement wherein said carrier material has a particle size of less than 10 microns, said hydrolyzable agent is a compound forming cyanate ions in said aqueous medium, and said aqueous medium, initially formed at a temperature of less than about 20° C., is heated to a temperature of between about 20° C. and 50° C. to hydrolyze said cyanate ions thereby gradually and homogeneously raising the hydroxyl ion concentration within said aqueous medium.

6. The process of claim 1, wherein said carrier material is a finely divided, highly porous silica or alumina, and said catalytically active composition includes at least one member selected from the group consisting of the elements nickel, cobalt, iron or copper, oxides of such elements, or any combination with each other or with other metals.

8. The proces of claim 1, wherein said separated carrier material, having said insoluble compound deposited thereon, is washed and dried and thereafter reduced at a temperature less than 500° C., thereby forming a metal as such catalytically active compound.

4,190,561

ESTERS OF CYCLOHEXENE, ODORIFEROUS COMPOSITIONS CONTAINING SAID ESTERS AND PROCESS FOR THE PREPARATION THEREOF

Bernard Auger, Peymeinade; Marcel Plattier, Antibes, and Paul J. Teisseire, Grasse, all of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

Filed Nov. 10, 1976, Ser. No. 740,361
Claims priority, application Switzerland, Nov. 17, 1975, 14896/75
Int. Cl.[2] C11B 9/00
U.S. Cl. 252—522 R 4 Claims

1. The compound 1,5,5-trimethyl-4-(1-formyloxy-ethyl)-cyclohex-1-ene.

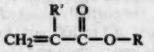
4,190,562

IMPROVED WATER ABSORBENT COPOLYMERS OF COPOLYMERIZABLE CARBOXYLIC ACIDS AND ACRYLIC OR METHACRYLIC ESTERS

Ira J. Westerman, Strongsville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 4, 1977, Ser. No. 784,100
Int. Cl.[2] C08F 20/18, 20/44, 20/56
U.S. Cl. 260—17.4 UC 18 Claims

1. A film forming water absorbing interpolymer of monomers comprising (1) from about 40 to 87 weight percent of an olefinically unsaturated carboxylic acid monomer, (2) 2 to 20 weight percent of an acrylic ester monomer of the formula



where R′ is hydrogen, methyl or ethyl and R is an alkyl group containing 10 to 30 carbon atoms and (3) 5 to 30 weight percent of at least one acrylic or methacrylic nitrile or amide said weight percents based on said interpolymer.

4,190,563

PARTICULATE ABSORBANT MATERIAL SURFACE TREATED WITH POLYETHER TO IMPROVE DISPERSIBILITY IN BLOOD

John A. Bosley, Higham Ferrers; Vicki Maddison, Bedford, and Alan A. McKinnon, Higham Ferrers, all of England, assignors to Lever Brothers Company, Inc., New York, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,924
Claims priority, application United Kingdom, Oct. 18, 1977, 43308/77; Apr. 10, 1978, 13951/78
Int. Cl.[2] C08L 3/02
U.S. Cl. 260—17.4 GC 10 Claims

1. A water-swellable particulate absorbant material surface-treated to enhance its dispersibility in blood with an effective amount of at least one polyether selected from the group consisting of polyoxyethylenes, polyoxypropylenes and polyoxyethylene-polyoxypropylene block copolymers, said effective amount of polyether being such as to permit capillary flow of blood through a mass of the particulate absorbent; wherein:
(a) said water-swellable particulate absorbent material has a water retention value of at least 2 g/g; and
(b) said polyether has a molecular weight of about 300 to about 6,000.

4,190,564
CATIONIC ELECTROPHORETIC COATING COMPOSITIONS

Akira Tominaga, and Yasuyuki Hirata, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Continuation of Ser. No. 783,229, Mar. 31, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,280
Claims priority, application Japan, Jun. 29, 1977, 52-38649
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 PT **11 Claims**

1. A cationic electrophoretic coating composition comprising an aqueous medium and a resinous binder dispersed therein, said resinous binder comprises:

(A) A water-soluble or water-dispersible resin prepared by contacting a reaction product with a partially blocked polyisocyanate having in the molecule not more than one free isocyanate group and at least one blocked isocyanate group on the average at a temperature of 40° to 130° C., and subsequently by neutralizing the resulting product with an acid, said reaction product being prepared by reacting a compound selected from the group consisting of fatty acid, polyamide or mixtures thereof with an adduct, said adduct being prepared by reacting an epoxy resin with a basic amino compound, the amount of said fatty acid and/or polyamide used being 1 to 100 parts by weight per 100 parts by weight epoxy resin and the basic amino compound being used in an amount not exceeding one mole per mole of epoxy group and

(B) at least one polymer selected from the group consisting of an ethylene oxide addition polymer, a propylene oxide addition polymer and derivatives of the ethylene oxide addition polymer and/or propylene oxide addition polymer, said polymers and derivatives having a number average molecular weight of 500 to 10,000 and having a solubility of up to 60 parts by weight in 100 parts by weight of water at 25° C., the partially blocked polyisocyanate being used in an amount of 1 to 100 parts by weight per 100 parts by weight of the epoxy resin and the component (B) being used in an amount of 0.5 to 30% by weight based on the component (A) as solid.

4,190,565
FILLED HOT-MELT ADHESIVES CONTAINING MODIFIED POLYETHYLENE

Mary J. Cook, and Kenneth W. Hyche, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,157
Int. Cl.[2] C08K *3/34*
U.S. Cl. 260—27 R **10 Claims**

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of

(a) about 35 to 90 percent by weight of at least one modified polyethylene having a saponification number of about 3 to 10 prepared by reacting polyethylene with a member of the group consisting of unsaturated polycarboxylic acid, anhydride and esters thereof,

(b) about 10 to 70 percent by weight of at least one filler having a particle size of less than 20 microns, and

(c) about 10 to 40 percent by weight of at least one tackifier resin selected from the group consisting of hydrocarbon resin, polyterpene resin and rosin ester resin.

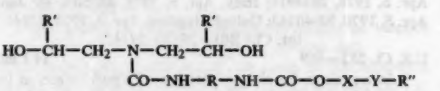
4,190,566
WATER-DISPERSIBLE POLYURETHANES

Klaus Noll, and Josef Pedain, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

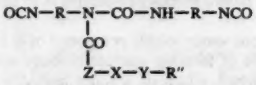
Filed Dec. 2, 1976, Ser. No. 746,919
Int. Cl.[2] C08L *75/12*; C08G *18/78*; C08L *75/08*
U.S. Cl. 260—29.2 TN **9 Claims**

1. Non-ionic, water-dispersible polyurethanes produced using an isocyanate group to isocyanate-reactive group equivalent ratio of from about 0.8:1 to 2.5:1 having a substantially linear molecular structure and about 3 to 30% by weight, based on the weight of the polyurethane, of lateral polyalkylene oxide polyether chains containing ethylene oxide units which are responsible for dispersibility, wherein from about 40 to 95% of the alkylene oxide units of the lateral polyalkylene oxide polyether chains, based on the number of alkylene oxide units, consist of ethylene oxide units and from about 5 to 60% are selected from the group consisting of propylene oxide, butylene oxide and styrene oxide units.

3. A process for producing water-dispersible polyurethanes having a substantially linear molecular structure and about 3 to 30% by weight, based on weight of the polyurethane, of lateral polyalkylene oxide polyether chains by reacting organic diisocyanates with difunctional organic compounds ("difunctional" in the context of the isocyanate polyaddition reaction) containing terminal isocyanate-reactive hydrogen atoms and having a molecular weight of from about 300 to 6000 in the presence of synthesis components containing hydrophilic groups which guarantee the dispersibility of the polyurethanes and optionally in the presence of chain extenders having a molecular weight below about 300 known in polyurethane chemistry and optionally in the presence of the aids and additives commonly used in polyurethane chemistry, wherein the synthesis components containing hydrophilic groups are diols corresponding to the following general formula:



and/or diisocyanates corresponding to the following general formula:



wherein

R—represents a difunctional radical of the type obtained by removing the isocyanate groups from a diisocyanate having a molecular weight of from about 112 to 1000,

R′—represents a hydrogen atom or a monofunctional hydrocarbon radical having from 1 to 8 carbon atoms,

X—represents a difunctional radical obtained by removing the terminal oxygen atom from a polyalkylene oxide radical having from about 5 to 90 alkylene oxide units, of which, based on the number thereof, from about 40 to 95% consist of ethylene oxide units and from about 5 to 60% are selected from the group consisting of propylene oxide, butylene oxide and styrene oxide units,

Y—represents oxygen or —NR‴—,

R″ and R‴ which may be the same or different, each represent monofunctional hydrocarbon radicals having from 1 to 12 carbon atoms, and

Z—represents a radical which has the same definition as Y and wherein the equivalent ratio of isocyanate groups to isocyanate-reactive groups is from about 0.8:1 to 2.5:1.

4,190,567
AQUEOUS CATIONIC POLYURETHANE EMULSION WITH GLYCIDYL ETHER CURING AGENT

Hidemasa Ohmura, and Masahiro Saito, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 857,026
Claims priority, application Japan, Dec. 13, 1976, 51/149543
Int. Cl.[2] C08L *63/00, 75/02, 75/12*
U.S. Cl. 260—29.2 TN **15 Claims**

1. A curable cationic polyurethane emulsion capable of

forming a film possessing excellent physical properties, which comprises a mixture of a cationic polyurethane resin aqueous emulsion and from 2 to 50 parts by weight, per 100 parts by weight of the polyurethane resin, of an epoxide group-containing compound selected from the group consisting of diglycidyl ethers of diol selected from ethylene glycol, propylene glycol, polyoxyethylene glycol, polyoxypropylene gycol, neopentyl glycol and bisphenol A, polyglycidyl ethers of polyol selected from glycerin, trimethylol propane, pentaerythritol, diglycerol and sorbitol, and allyl glycidyl ether and oligomers thereof, said cationic polyurethane resin emulsion having been prepared by either

(1) reacting an isocyanate-terminated urethane prepolymer (A) with an excess amount of a polyalkylene polyamine to form a polyurethane urea polyamine (B), and either
  (a) mixing said polyurethane urea polyamine (B) with an aqueous solution of an acid,
  (b) reacting said polyurethane urea polyamine (B) with an epihalohyrin and mixing the resulting reaction product with an aqueous solution of an acid, or
  (c) partially reacting free amino groups of said polyurethane urea polyamine (B) with a blocked polyisocyanate having one free isocyanate group, which blocked polyisocyanate has been obtained by reacting a polyisocyanate with an isocyanate-blocking agent, and mixing the resulting reaction with an aqueous solution of an acid, or

(2) reacting said urethane prepolymer (A) with a polyalkylene polyamine derivative having at least two primary or secondary amino groups and at least one functional group having the formula $—CH_2—CH(OH)—CH_2X$, in which X is Cl, or BR, and mixing the resulting reaction product with an aqueous solution of an acid.

4,190,568

MINERAL STABILIZED RESIN EMULSION

Fred H. Haney, 10216 Vultee Ave., Downey, Calif. 90241

Filed Jan. 2, 1979, Ser. No. 512

Int. Cl.² C08L *23/26*

U.S. Cl. 260—29.6 XA **12 Claims**

1. A mineral stabilized resin emulsion formed as an aqueous slurry consisting essentially of:

(i) about 35 to about 65 percent by weight of a material selected from the group consisting of low to zero acid number hydrocarbon resins having a softening point above about 80° F. and penetration within a range of from about 40 dmm to 190 dmm at 77° F.,

(ii) about 0.2 to about 2.0 percent by weight of at least one component selected from the group consisting of benzoic acid, stearic acid, octanoic acid, napthenic acid, salicylic acid and mixtures thereof for solubilizing said hydrocarbon resin,

(iii) about 2.0 to about 5.0 percent by weight of a mineral stabilizer selected from the group consisting of montmorillonite mineral compounds, clays, and mixtures thereof, and

(iv) about 0.1 to about 4.0 percent by weight of a complexing agent selected from the group consisting of hydrochloric acid, sulfuric acid, acetic acid, phosphoric acid, chromic acid, sodium dichromate, potassium dichromate, aluminum sulfate, aluminum chloride, calcium chloride, magnesium sulfate, sodium aluminate, ferric chloride, ammonium chloride and mixtures thereof;

(v) about 35 to about 55 percent by weight water;

the water solubility of the reaction product formed upon reaction of said complexing agent with the solubilized hydrocarbon resin i) being at least about 0.02 gms. per hundred grams of water.

4,190,569

BAKING FINISHES OF LOW SOLVENT CONTENT

Ruprecht Kroker, Bobenheim-Roxheim; Hans Sander, Ludwigshafen, and Hermann Gausepohl, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 820,721, Aug. 1, 1977, abandoned. This application Sep. 6, 1978, Ser. No. 939,969

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728459

Int. Cl.² C08K *5/05*

U.S. Cl. 260—31.6 **7 Claims**

1. A baking finish of low solvent content comprising (A) an acrylate resin, (B) an epoxy resin, and (C) a mixture of organic solvents, with or without pigment, catalyst and other conventional auxiliaries, the acrylate resin (A) being a copolymer containing α,β-olefinically unsaturated carboxylic acid copolymerized units having a K value (measured by the Fikentscher method) of less than 15 and an acid number of from 70 to 250 mg of KOH/g; the epoxy resin (B) containing at least 2 oxirane groups per molecule, and the organic solvent mixture (C) comprising from 20 to 80% by weight of a solvent having a boiling point of from 100° to 280° C. and a dielectric constant of from 2 to 4.99 and from 80 to 20% by weight of a solvent having a boiling point from 80° to 200° C. and a dielectric constant of from 5 to 27, the weight ratio of the components (A):(B) being from 9:1 to 6:4 and the weight ratio of the components (A + B):(C) being from 7:3 to 5:5, wherein the acrylate resin (A) has a mean molecular weight $\overline{Mn}$ of from 1500 to 3000 and an inhomogeneity (Mw/Mn), measured by gel permeation chromatography of from 1.5 to 2.0, said acrylate resin (A) being a copolymer of from 12 to 25% by weight of acrylic acid or methacrylic acid, from 5 to 70% by weight of one or more esters of acrylic acid or methacrylic acid from the group consisting of ethyl acrylate, methyl methacrylate, ethyl methacrylate, butyl methacrylate, 2-ethylhexyl acrylate n-butyl acrylate, from 5 to 70% by weight of styrene and from 0 to 20% by weight of an alkanediol monoester of acrylic acid or methacrylic acid.

4,190,570

CABLE FILLER

John J. Kaufman, Parker, Pa., and Thomas E. Luisi, Plainview, N.Y., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 798,977, May 20, 1977, Pat. No. 4,105,619. This application Aug. 4, 1978, Ser. No. 931,051

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 PQ **13 Claims**

1. A cable filling and flooding composition comprising at least about 90% by weight of petrolatum; about 5–7% by weight polybutene-1; about 0.5–2.0% by weight of polyethylene; and about 0.5–2.0% by weight of an amorphous rubber.

4,190,571

SUBSTITUTED 2-KETO-1,4-DIAZACYCLOALKANES AND UV-LIGHT-STABILIZED COMPOSITIONS CONTAINING THEM

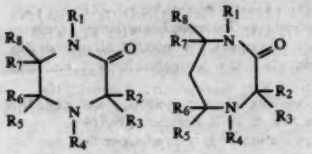
John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 21, 1977, Ser. No. 835,065

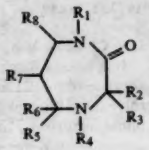
Int. Cl.² C08K *5/34*

U.S. Cl. 260—45.8 N **19 Claims**

1. A composition resistant to degradation by ultraviolet light comprising an organic polymer subject to ultraviolet light degradation having dispersed therein an effective amount of a 2-keto-1,4-diazacycloalkane stabilizer compound represented by a structural formula selected from the group consisting of



and



wherein, R_1 and R_4 independently represent hydrogen, alkyl, hydroxyalkyl, haloalkyl, cyanoalkyl, aminoalkyl, alkenyl, aralkyl, and carboalkoxy;

R_4 optionally also represents oxygen;

R_2 and R_3 independently represent alkyl, haloalkyl, cyanoalkyl, cycloalkyl, hydroxy-cycloalkyl, aminoalkyl, and alkenyl; and,

R_5, R_6, R_7, R_8 independently represent alkyl, haloalkyl, cyanoalkyl, aminoalkyl, alkenyl, and aralkyl;

R_7, R_8 additionally also represent hydrogen; and,

R_7, R_8, may when taken together with the carbon atom to which they are attached, form an alkylene ring.

4,190,572

METHOD OF PRODUCING A LEATHER-LIKE SHEET WITH A DELICATE APPEARANCE AND A DELUXE HAND

Takeo Nishimura, Okayama; Mikihiro Matsui, Ibaraki; Tomio Mizuse, and Shunji Ishizaki, both of Himeji, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

Continuation-in-part of Ser. No. 805,700, Jun. 13, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,759

Claims priority, application Japan, Jun. 14, 1976, 51/70061

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—46.4 **8 Claims**

1. A method of producing a leather-like sheet having a deluxe feeling comprising producing a fully cured leather-like sheet comprising a porous substrate consisting of a porous layer of elastomer and a porous layer of fibrous material and a nonporous coating layer of elastomer coated in a thickness of 0.5 to 50μ on the surface of said porous substrate, crumpling said fully cured sheet in the substantial absence of tension in a liquid medium which is inert to the constituents of the leather like sheet and, then drying said crumpled sheet at a temperature not exceeding 100° C. in the substantial absence of tension.

4,190,573

PROCESS FOR THE ISOLATION OF THE POLYVALENT PROTEINASE INHIBITOR

Oswald Zwisler; Gerhard Guthöhrlein; Hans-Heinrich Nau, all of Marburg an der Lahn, and Helmut Rinno, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 881,527, Feb. 27, 1978, abandoned, which is a continuation of Ser. No. 713,814, Aug. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 549,432, Feb. 12, 1975, abandoned. This application Feb. 12, 1979, Ser. No. 11,679

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1974, 2406971

Int. Cl.[2] C07G *17/00*

U.S. Cl. 260—112 R **9 Claims**

1. In a method for isolating polyvalent proteinase inhibitor, obtained by the aqueous extraction of animal organs, from an aqueous solution of said inhibitor, which method comprises contacting said aqueous solution with an acid ion exchanger to adsorb said inhibitor thereon and subsequently desorbing said inhibitor from said acid ion exchanger, the improvement wherein said aqueous solution of said inhibitor is contacted at a pH from 0.5 to 10.5 with an ion exchanger selected from the group consisting of polyphenol-ω-sulfonic acid, polystyrene sulfonic acid, and polystyrene phosphonic acid and having a particle size between 0.03 and 0.08 mm, or with an ion exchanger which is a copolymer of ethene sulfonate and acrylamide having a particle size between 0.03 and 3 mm, whereby said inhibitor is adsorbed on said ion exchanger, and said inhibitor is then eluted from said ion exchanger with water or a salt solution at a pH from 1 to 13.

4,190,574

SUBSTRATE FOR THE QUANTITATIVE DETERMINATION OF PLASMINOGEN ACTIVATORS

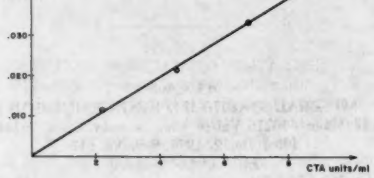
Lars G. Svendsen, Reinach, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland

Filed May 19, 1977, Ser. No. 798,426

Claims priority, application Switzerland, May 28, 1976, 006816/76

Int. Cl.[2] C07C *103/52*; C12K *1/04*

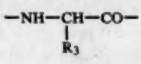
U.S. Cl. 260—112.5 R **5 Claims**



1. A substrate for use as a reagent in the determination of plasminogen activators, inhibitors thereof and plasminogen preactivators, and trypsin, trypsin inhibitors and trypsinogen in human and mammal body fluids and tissue extracts which has the following structure:

$$R^1—X—Y—Z—NH—R^2 \qquad I$$

wherein X represents a group having the formula



in which R^3 is a straight or branched alkyl radical having 1 to 7 carbon atoms or a cyclohexyl or cyclohexylmethyl radical, Y represents a seryl group or a glycol group. Z represents an arginyl group, R^1 represents hydrogen or an acyl or sulfonyl group and R^2 represents an aromatic hydrocarbon radical optionally carrying substituents which permit chromophoric or fluorescent activity, —NH—R^2 being a chromophoric or fluorescent group, and which has the property to release a split product of formula NH_2R^2 under the action of plasminogen activators, the quantity of said split product being quantitatively measurable by photometric, spectrophotometric or fluorescence-photometric methods.

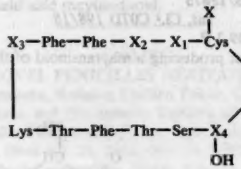
4,190,575

POLYPEPTIDES RELATED TO SOMATOSTATIN

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,173
Int. Cl.[2] C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 S 5 Claims

1. A compound of the formula:



wherein:

X is H, Ala-Gly, Gly-Gly-Gly, Ala-D-Ala, acetyl, or benzoyl;

X_1 is Arg or His;

X_2 is Glu or Asp;

X_3 is Trp or D-Trp; or 6-F-D-Trp; and

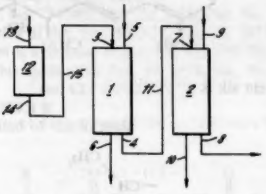
X_4 is Cys or D-Cys; or the reduced linear form thereof, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,190,576

SEPARATION OF MACROMOLECULES

Alan R. Thomson, Abingdon, and Brynley J. Miles, Faringdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 18, 1976, Ser. No. 743,292
Claims priority, application United Kingdom, Nov. 26, 1975, 48693/75
Int. Cl.[2] A23J *1/20*; B01D *15/04*
U.S. Cl. 260—122 13 Claims



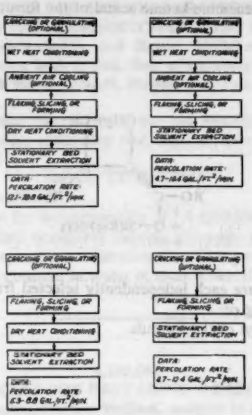
1. A process for the separation of macromolecules from a fluid substance containing the macromolecules which comprises contacting the fluid substance with discrete porous absorbent particles of inorganic material having an interconnected porosity throughout which provides an extended surface area and a pore structure such as will allow the macromolecules to permeate the particles and be sorbed, the pores of said particles having a diameter in the range of 1,000 to 10,000 A, the discrete porous particles being selected such that a proportion thereof have acidic surfaces for contacting the macromolecules in the fluid substance and a proportion thereof have basic surfaces for contacting the macromolecules in the fluid substance.

4,190,577

LOW FAT PEANUT FLOUR PREPARED BY SOLVENT EXTRACTION OF OIL FROM PEANUT FLAKES

Bobby C. Steele, Conyers; Douglas R. Barr, Norcross; Charles T. Hunt, Lithonia, and James L. Ayres, Stone Mountain, all of Ga., assignors to Gold Kist, Incorporated, Lithonia, Ga.

Division of Ser. No. 521,145, Nov. 5, 1974, Pat. No. 4,008,210.
This application Nov. 18, 1976, Ser. No. 742,882
Int. Cl.[2] A23J *1/14*; C11B *1/10*
U.S. Cl. 260—123.5 2 Claims


CRACKING OR GRANULATING (OPTIONAL)
WET HEAT CONDITIONING
AMBIENT AIR COOLING (OPTIONAL)
FLAKING, SLICING, OR FORMING
DRY HEAT CONDITIONING
STATIONARY BED SOLVENT EXTRACTION
DATA: PERCOLATION RATE: 121-128 Gal./Ft.² /min.
CRACKING OR GRANULATING (OPTIONAL)
WET HEAT CONDITIONING
AMBIENT AIR COOLING (OPTIONAL)
FLAKING, SLICING, OR FORMING
STATIONARY BED SOLVENT EXTRACTION
DATA: PERCOLATION RATE: 47-164 Gal./Ft.² /min
CRACKING OR GRANULATING (OPTIONAL)
FLAKING, SLICING, OR FORMING
DRY HEAT CONDITIONING
STATIONARY BED SOLVENT EXTRACTION
DATA: PERCOLATION RATE: 43-88 Gal./Ft.² /min
CRACKING OR GRANULATING (OPTIONAL)
FLAKING, SLICING, OR FORMING
STATIONARY BED SOLVENT EXTRACTION
DATA: PERCOLATION RATE: 47-124 Gal./Ft.² /min

1. A low fat peanut flour from which the bitter, musty, raw peanut flavor has been removed made from a process which comprises, wet heat conditioning at a temperature of from 160° to 240° F. whole peanuts, peanut splits, peanut granules, or cracked peanuts to a moisture content of more than 6 but less than 12%, flaking said wet heat conditioned peanuts, dry heat conditioning said flaked peanuts to a moisture content of from 1.9 to 6% and treating said dry heat conditioned flakes with a hydrocarbon solvent for the removal of oil contained in said flakes.

4,190,578

DIALYSIS MONITORED PREPARATION OF METAL SALTS OF AZO PIGMENTS

Alexander Hamilton, and Colin Nelson, both of Glasgow, Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,299
Claims priority, application United Kingdom, Oct. 28, 1976, 44771/76
Int. Cl.[2] C09B *45/14, 45/16, 45/18, 45/20*
U.S. Cl. 260—150 6 Claims

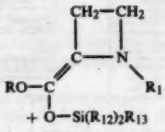
1. An azo, sulfonated dyestuff process in which the amount of excess sulfonated diazo or coupling component is continuously monitored and the addition of diazo component or coupling component to the reaction is automatically controlled by means of an automatic chemical analyser which incorporates a dialyzer module, wherein an azo metal sulfonate salt pigment of a water-soluble sulfonated dyestuff is obtained by adding the corresponding water-soluble aluminum, cadmium, chromium, cobalt, copper, iron, lead, magnesium, mercury, nickel, tin, titanium, zinc, calcium, barium, strontium or manganese metal salt to said water-soluble sulfonated azo dyestuff at some stage prior to the passage of the sample through the dialyser.

4,190,579
SYNTHESIS OF BETA-LACTAMS FROM AZETIDINE CARBOXYLIC ACID ESTERS

Harry H. Wasserman, New Haven, Conn.; Bruce H. Lipshutz, Yonkers, N.Y., and James S. Wu, New Haven, Conn., assignors to Research Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,593
Int. Cl.[2] C07D *205/08, 403/06, 409/06, 407/06*
U.S. Cl. 260—239 A 7 Claims

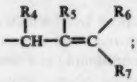
1. A process for preparing a cyclic lactam which comprises oxidizing an enamine ketene acetal of the formula



wherein

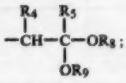
R and R_1 are each independently selected from the group consisting of:

(a) alkenyl of the formula



wherein R_4 is alkoxy, aryloxy, alkoxyaryl, aryloxyalkyl or aryloxyaryl, R_5 is hydrogen or alkyl of 1–3 carbon atoms and R_6 and R_7 are each hydrogen or alkyl of 1–3 carbon atoms;

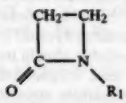
(b) an acetal group of the formula



wherein R_4 and R_5 have the above-indicated values and R_8 and R_9 are each alkyl of 1–3 carbon atoms or R_8 or R_9, together with the oxygen atoms to which they are bonded, form alkylenedioxy of 2–3 carbon atoms;

R_{12} and R_{13} are each independently alkyl, phenyl, alkylphenyl, phenylalkyl or alkylphenylalkyl of 1–4 carbon atoms in each alkyl group

with singlet oxygen to form a corresponding cyclic lactam of the formula:



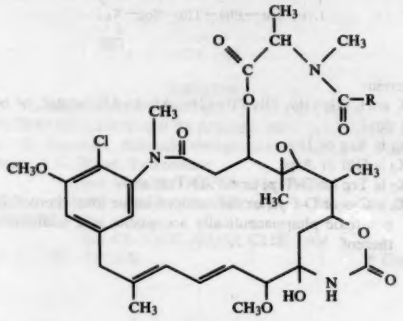
wherein R_1 has the above-indicated values.

4,190,580
OPTICALLY ACTIVE MAYTANSINOIDS AND MAYTANSINOID PRODUCTION METHOD

Naoto Hashimoto, Suita, and Toyokazu Kishi, Nara, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

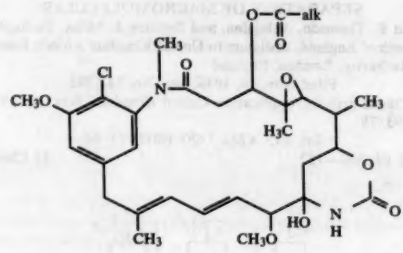
Division of Ser. No. 886,815, Mar. 15, 1978, Pat. No. 4,137,230.
This application Oct. 5, 1978, Ser. No. 948,895
Claims priority, application Japan, Nov. 14, 1977, 53/137078; Feb. 20, 1978, 53/18675
Int. Cl.[2] C07D *198/18*
U.S. Cl. 260—239.3 P 11 Claims

1. A method of producing a maytansinoid of the formula:



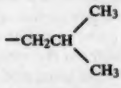
wherein R is lower alkyl, which comprises:

(a) treating a compound of the formula



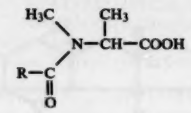
wherein alk is

$-CH_2CH_2CH_3$ or



under conditions of reductive hydrolysis to yield maytinsinol; and

(b) contacting the maytansinol with an acid of the formula



wherein R is lower alkyl, in the presence of a carbodiimide to yield said maytansinoid.

4,190,581

NOVEL PENICILLIN DERIVATIVES

Yoshiaki Watanabe, Kodaira; Chihiro Yokoo, Gyoda; Toshifumi Asaka, Omiya, and Jiro Sawada, Kodaira, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

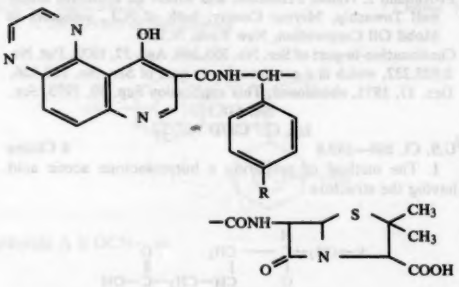
Filed Jul. 31, 1978, Ser. No. 929,566

Claims priority, application Japan, Aug. 12, 1977, 52-96726; Dec. 28, 1977, 52-160559

Int. Cl.[2] C07D *499/50, 401/04*

U.S. Cl. 260—239.1 **5 Claims**

1. Penicillin derivatives of the formula



and pharmaceutically acceptable salts thereof, wherein R is hydrogen or hydroxy.

4,190,582

ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES

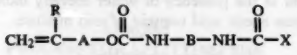
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 734,945, Oct. 22, 1976, Pat. No. 4,113,958, which is a division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,644

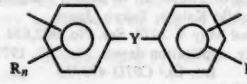
Int. Cl.[2] C07D *223/10*

U.S. Cl. 260—239.3 R **2 Claims**

1. A compound of the formula



wherein R is hydrogen or a methyl or ethyl group; A is a carbonyloxyalkylene group having 2 to about 8 carbon atoms or an aralkylene group having 7 to about 12 carbon atoms; B is a bivalent aromatic group selected from the group consisting of arylene, naphthalene, and a group having the formula



where R is defined as above; Y is O, S, or $-(CH_2)_n$; n=0 to 3; and X is the group remaining after a hydrogen atom is removed from the nitrogen atom of caprolactam.

2. A compound of claim 1 wherein R is hydrogen or methyl group; B is phenylene, tolylene, naphthalene, or a group where Y is $-(CH_2)_n$, and n=0 to 1.

4,190,583

PROCESS FOR THE PREPARATION OF 3,4-METHYLENEDIOXYMANDELIC ACID

Kurt Bauer, Holzminden, and Reiner Molleken, Galmback Ortst. Warbsen, both of Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,553

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754490

Int. Cl.[2] C07D *317/44*

U.S. Cl. 260—340.5 R **2 Claims**

1. A process for the preparation of 3,4-methylenedioxymandelic acid, which comprises reacting glyoxylic acid with 1,2-methylenedioxybenzene in the presence of a strong acid having a dissociation constant in water of over 4.74×10^{-4}.

4,190,584

PROCESS FOR PREPARING OXAZOLES

George O. Weston, Havant, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

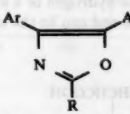
Continuation-in-part of Ser. No. 822,596, Aug. 8, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,123

Claims priority, application United Kingdom, Aug. 13, 1976, 33876/76

Int. Cl.[2] C07D *263/32*; A61K *31/42*

U.S. Cl. 548—236 **7 Claims**

1. In a process for the preparation of a compound selected from 4,5-diaryloxazol-2-ylalkanoic acids having the formula

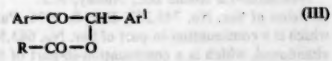


(I)

wherein Ar and Ar^1 represent the same or different aryl radicals selected from the group consisting of phenyl, naphthyl, thienyl, furyl and phenyl substituted by halogen, lower alkyl, lower alkoxy, trifluoromethyl, nitro and di(lower alkyl)amino and R represents carboxyethyl or carboxypropyl, and their non-toxic salts, wherein an aroylaryl carbinol having the formula

(II)

(where Ar and Ar^1 are as defined above) is esterified with a reactive derivative of a butanedioic or pentanedioic acid to form a keto ester having the formula



(III)

(where Ar, Ar^1 and R are as defined above) in a reaction mixture, and the keto ester is cyclised with a nitrogen-donating cyclising agent to form an oxazole, the improvement which comprises adding the nitrogen-containing cyclising agent to the reaction mixture in which the keto ester is formed.

4,190,585

PROCESS FOR THE PRODUCTION OF INDOLYL LACTIC ACID

Leander Tenud, Visp, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

Filed Sep. 13, 1974, Ser. No. 505,566
Claims priority, application Switzerland, Sep. 13, 1973, 13171/73
Int. Cl.[2] C07D *307/22, 209/218*
U.S. Cl. 260—326.13 R 14 Claims

1. The process for the production of indolyl lactic acid which comprises: (i) heating an aqueous solution of 2,3-dihydro-2,5-furan dicarboxylic acid to boiling, (ii) reacting the aqueous solution with phenyl hydrazine or a water soluble HX salt of phenyl hydrazine, wherein X is chlorine, bromine, iodine, fluorine or bisulfate, and (iii) converting the resulting phenylhydrazone by heating from 100° to 150° C. with an aqueous solution containing 8 to 15 percent of sulfuric acid to indolyl lactic acid.

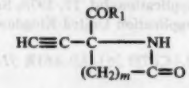
4,190,586

α-ACETYLENIC DERIVATIVES OF α-AMINO ACIDS

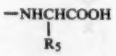
Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 812,267, Jul. 1, 1977, Pat. No. 4,133,964. This application Oct. 2, 1978, Ser. No. 947,940
Int. Cl.[2] C07D *207/26, 211/76*
U.S. Cl. 260—326.45 4 Claims

1. A compound of the formula



wherein m is the integer 2 or 3, and R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $—NR_3R_4$ wherein each of R_3 and R_4 is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms and can be the same or different, or



wherein R_5 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and pharmaceutically acceptable salts and individual optical isomers thereof.

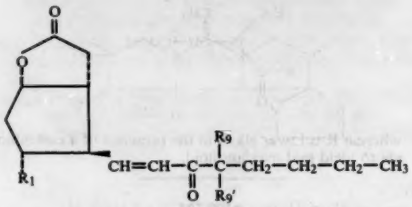
4,190,587

4-(3-OXO-4-TRIFLUOROMETHYL-1-OCTENYL)-2-OXO-2H-CYCLOPENTA[B]FURANS

George W. Holland, North Caldwell; Jane L. Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 745,257, Dec. 8, 1976, Pat. No. 4,112,225, which is a continuation-in-part of Ser. No. 683,576, May 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 480,458, Jun. 18, 1974, Pat. No. 4,052,446, which is a continuation-in-part of Ser. No. 386,117, Aug. 6, 1973, abandoned. This application Jun. 23, 1978, Ser. No. 918,626
Int. Cl.[2] C07D *307/93*
U.S. Cl. 260—343.3 P 3 Claims

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl, $—CH_2OR_1'$ or $—COOR_1'$; R_1' is lower alkyl or hydrogen; R_9 is hydrogen, lower alkyl or fluoro; R_9' is trifluoromethyl or enantiomers or racemates thereof.

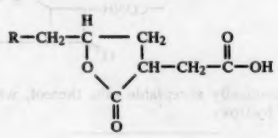
4,190,588

METHOD OF PREPARING A SUBSTITUTED BUTYROLACTONE ACETIC ACID

El-Ahmadi I. Heiba, Princeton, and Albert L. Williams, Hopewell Township, Mercer County, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,360, Apr. 27, 1973, Pat. No. 3,925,232, which is a continuation-in-part of Ser. No. 212,626, Dec. 27, 1971, abandoned. This application Sep. 30, 1975, Ser. No. 618,173
Int. Cl.[2] C07D *307/32*
U.S. Cl. 260—343.6 4 Claims

1. The method of preparing a butyrolactone acetic acid having the structure



wherein R is hydrogen or hydrocarbyl of 1 to about 300 carbon atoms, said method comprising the steps of (1) reacting an alkenyl succinic anhydride, wherein the first and second carbon atoms attached to the succinyl group are unbranched, with a mineral acid in the presence of water thereby forming a reaction mixture of said butyrolactone acetic acid and by-product alkenyl succinic diacid, (2) treating said reaction mixture with an inert organic solvent and distilling, thereby withdrawing said solvent, said mineral acid and water from said reaction mixture and converting said by-product alkenyl succinic diacid to anhydride, and (3) subsequently treating the mixture of said butyrolactone acetic acid and alkenyl succinic anhydride with mineral acid in the presence of water thereby increasing the butyrolactone acetic acid content of said mixture.

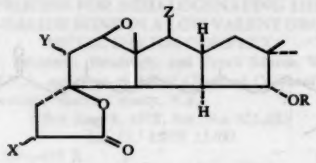
4,190,589

CORIOLIN DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Yuya Nakayama, Omiya; Mamoru Kunishima, Tokorozawa; Akira Matsuda, Omiya; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1978, Ser. No. 902,824
Claims priority, application Japan, May 17, 1977, 53/56019
Int. Cl.[2] C07D *493/10*
U.S. Cl. 260—343.6 5 Claims

1. Coriolin derivatives represented by the general formula:



where
R: $-CO(CH_2)_6CH_3$ or $-COCH(OH)(CH_2)_5CH_3$,
X: $=CH_2$,
Y: OH, $=O$ and
Z: $-OH$ or $-OCH_3$.

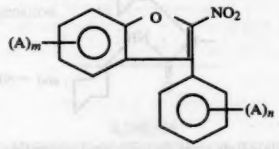
4,190,590

AZIDE AND ISOCYANATE DERIVATIVES OF 2-NITRO-3-PHENYLBENZOFURAN

Vernon R. Fletcher, Davis, Calif., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Dec. 26, 1978, Ser. No. 973,152
Int. Cl.² C07D *307/82, 307/84*
U.S. Cl. 260—346.73 **7 Claims**

1. A compound of the formula



wherein A is OCN— or

and m and n are zero or one and the sum of m and n is one.

4,190,591

ODORANT AND FLAVORANT

Roman Kaiser, Uster, and Peter Naegeli, Wettingen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Jan. 11, 1978, Ser. No. 868,632
Claims priority, application Austria, Jan. 21, 1977, 364/77; Switzerland, Jul. 27, 1977, 9281/77
Int. Cl.² C07D *307/94*
U.S. Cl. 260—347.8 **1 Claim**

1. Synthetically manufactured 2,6,10,10-tetramethyl-1-oxaspiro[4,5]-decan-7-one.

4,190,592

PROCESS FOR SPLITTING THE L-(−)-α-PHENYLETHYLAMINE SALT OF D-(−)-α-AZIDOPHENYLACETIC ACID

Günter Bison, Troisdorf-Sieglar; Reiner Elfgen, Troisdorf-Spich; Walter Heinzelmann, Lecerkusen; Josef Winterscheid, St. Augustin, and Wolfgang Wolfes, Mondorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 26, 1975, Ser. No. 617,166
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1974, 2446656
Int. Cl.² C07C *117/08*
U.S. Cl. 260—349 **13 Claims**

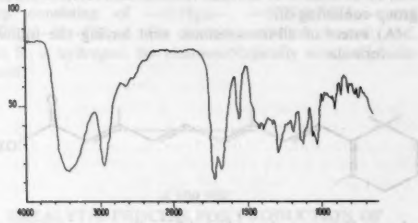
1. A process for splitting the L-(−)-α-phenylethylamine salt of D-(−)-α-azidophenylacetic acid and for producing a pure D-(−)-α-azidophenylacetic acid, which comprises forming a suspension of the salt and a liquid diluent in which the salt is insoluble and in which D-(−)-α-azidophenylacetic acid is soluble, admixing particles of an acidic cation exchange material with said suspension, reacting the salt with the acidic cation exchange material at a temperature of not more than 40° C. in the presence of said liquid diluent and recovering a highly purified D-(−)-α-azidophenylacetic acid from the resultant reaction mixture.

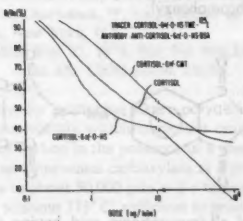
4,190,593

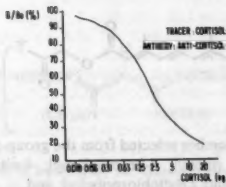
CORTISOL RADIOIMMUNOASSAY METHOD AND CORTISOL DERIVATIVES USEFUL THEREFOR

Masaharu Kojima; Hisao Sone, both of Fukuoka; Hiroshi Ogawa, Kashiwa; Nobuhiko Nakazawa, Urawa, and Seiji Tachibana, Tokyo, all of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

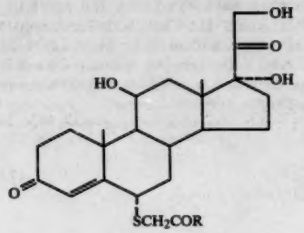
Filed Jun. 1, 1977, Ser. No. 802,397
Claims priority, application Japan, Jun. 1, 1976, 51-63985
Int. Cl.² C07J *5/00*
U.S. Cl. 260—397.45 **6 Claims**







1. A compound of the formula (E)



(E)

wherein R represents a tyrosine lower alkyl ester residue, a tyramine moiety, a histamine residue, a 7-aminoheptanoyltyrosine lower alkyl ester moiety, a radioiodinated tyrosine lower alkyl ester moiety, a radioiodinated tyramine residue, a radioiodinated histamine moiety, a radioiodinated 7-aminoheptanoyltyrosine lower alkyl ester moiety, or a polylysine.

4,190,594

RETINOIC ACID DERIVATIVES

Robert J. Gander, Whitehouse, and John A. Gurney, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

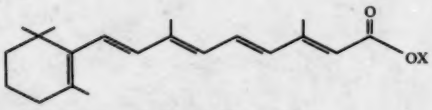
Division of Ser. No. 628,177, Nov. 3, 1975, Pat. No. 4,108,880. This application May 15, 1978, Ser. No. 906,168

Int. Cl.² C09F *5/00;* C11C *3/00;* A61K *7/42*

U.S. Cl. 260—404 **8 Claims**

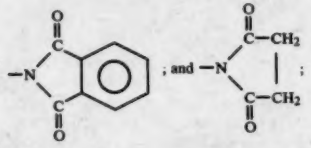
1. A derivative of all-trans-retinoic acid selected from the group consisting of:

(A) esters of all-trans-retinoic acid having the following formula:

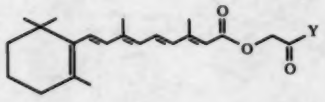


(I)

wherein X is a member selected from the group consisting of: 2-cyclohexylethyl; 10-carbomethoxydecyl; 4-hydroxybutyl; cholesteryl; 4-bromobenzyl;



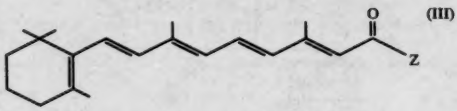
(B) esters of all-trans-retinoic acid having the following formula:



(II)

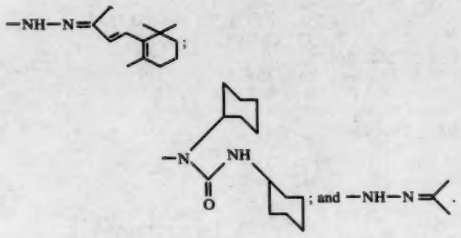
wherein Y is a member selected from the group consisting of: cholesteryl; phenyl; 4-bromophenyl; 4-nitrophenyl; 4-cyanophenyl; and 2,4-dichlorophenyl; and

(C) amides of all-trans-retinoic acid having the following formula:

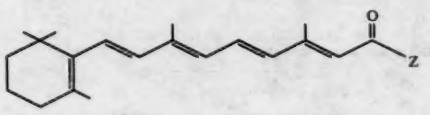


(III)

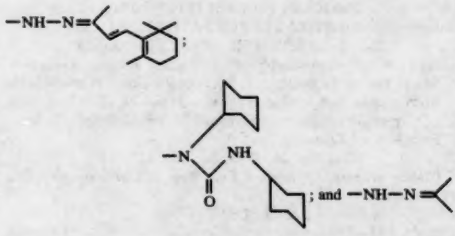
wherein Z is a member selected from the group consisting of: n-propylamino; tert.-butylamino; 1,1,3,3-tetramethylbutylamino; 4-hydroxyphenylamino; 4-carbomethoxy-3-hydroxyphenylamino; β-(3,4-dimethoxyphenyl)-ethylamino; 2-benzothiazolylamino; 1-imidazolyl; 1-(2-nicotinoylhydrazolyl); 1-benzotriazolyl; 1-(1,2,4-triazolyl);



2. An amide of all-trans retinoic acid according to claim 1 having the following formula:



wherein Z is a member selected from the group consisting of: n-propylamino; tert.-butylamino; 1,1,3,3-tetramethylbutylamino; 4-hydroxyphenylamino; 4-carbomethoxy-3-hydroxyphenylamino; β-(3,4-dimethoxyphenyl)-ethylamino; 2-benzothiazolylamino; 1-imidazolyl; 1-(2-nicotinoylhydrazolyl); 1-benzotriazolyl; 1-(1,2,4-triazolyl);



3. N-n-Propyl all-trans-retinamide according to claim 2.

4,190,595

PROCESS FOR DEHALOGENATING THE METAL-HALIDE BOND IN A LOW VALENT GROUP VIII METAL HALIDE COMPLEX

Steven E. Diamond, Randolph, and Frank Mares, Whippany, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 8, 1978, Ser. No. 931,653
Int. Cl.[2] C07F 15/00
U.S. Cl. 260—429 R 19 Claims

1. A process for dehalogenating the metal-halide bond in a low valent Group VIII metal halide complex comprising the step of reacting the metal halide complex, containing at least one metal-halide bond with an alkali or alkaline earth metal alkylamide, containing at least one alkyl group containing a hydrogen atom in the beta position with respect to the metal atom, in an inert anhydrous organic solvent therefor, at a temperature from about −80° C. to the decomposition temperature of the metal complex resulting from the dehalogenation, under an inert atmosphere and anhydrous conditions, at a pressure from about 0.001 to 10 atmospheres, said metal alkylamide being present in an amount of at least about 1 equivalent per equivalent of metal-halide bond in said metal halide complex desired to be dehalogenated, and said metal halide complex containing ligands capable of stabilizing the metal halide complex and said metal atom capable of forming metal-ligand bonds capable of stabilizing the metal complex resulting from the dehalogenation.

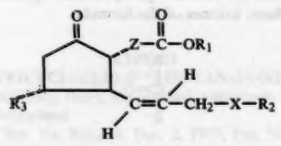
4,190,596

VARIOUS 15-DEOXY-16-HYDROXY-16-ETHYNYL AND 16-ETHYNYLSUBSTITUTED PROSTAGLANDINS

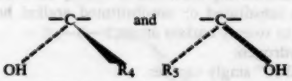
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Dec. 5, 1977, Ser. No. 857,848
Int. Cl.[2] C07C 177/00
U.S. Cl. 260—448.2 D 56 Claims

1. An optically active compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and C_1 to C_6 alkyl; R_2 is selected from the group C_3 to C_7 alkyl; R_3 is selected from the group consisting of hydrogen and hydroxy; X is selected from the group consisting of a divalent moiety of the formula:



wherein R_5 is selected from the group consisting of ethynyl, 1-propynyl and trimethylsilylethynyl; Z is selected from the group consisting of $-(CH_2)_6-$, $-(CH_2)_4SCH_2-$ and $-(CH_2)-O-CH_2-$; the racemic mixture thereof; the mirror image thereof; and, when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

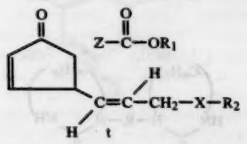
4,190,597

VARIOUS 15-DEOXY-16-HYDROXY-16-ETHYNYL AND 16-ETHYNYLSUBSTITUTED PROSTAGLANDINS

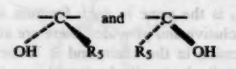
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Dec. 5, 1977, Ser. No. 857,849
Int. Cl.[2] C07C 177/00
U.S. Cl. 260—448.2 D 47 Claims

1. An optically active compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and C_1 to C_6 alkyl; R_2 is selected from the group consisting of C_3 to C_7 alkyl; X is selected from the group consisting of a divalent moiety of the formula:



wherein R_5 is selected from the group consisting of ethynyl, 2-propynyl and trimethylsilylethynyl; Z is selected from the group consisting of $-(CH_2)_6-$, $-(CH_2)_4SCH_2-$ and $-(CH_2)_4-O-CH_2-$; the racemic mixture thereof; and, when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

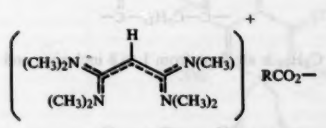
4,190,598

CATALYTIC PROCESS FOR PRODUCTION OF POLYHYDRIC ALCOHOLS IN PRESENCE OF AMMONIUM CARBOXYLATES

Leonard Kaplan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 27, 1978, Ser. No. 946,314
Int. Cl.[2] C07C 27/06, 29/16
U.S. Cl. 260—449 L 7 Claims

1. The process for producing alkane polyols in a homogeneous liquid phase mixture which comprises reacting hydrogen and an oxide of carbon in the presence of a rhodium carbonyl complex and an ammonium carboxylate at a pressure of from about 500 psia to about 50,000 psia and a temperature of from about 100° C. to about 375° C. sufficient to produce said alkane polyols, wherein said ammonium carboxylate has the general formula:



wherein R is hydrogen, an unsubstituted monovalent hydrocarbon radical or a substituted monovalent hydrocarbon radical where the substituent is halogen, hydroxyl, nitro, sulfonyl, phosphoryl, alkoxy, oxo, carbalkoxy or alkoxycarbonyl.

4,190,599

AMIDE-CONTAINING DIISOCYANATES AND PREPARATION THEREOF

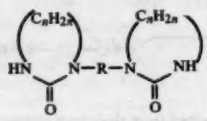
Reinhard H. Richter, North Haven; Benjamin W. Tucker, Bethany, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 874,402, Feb. 1, 1978, Pat. No. 4,138,398, which is a continuation-in-part of Ser. No. 754,189, Dec. 27, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,252

Int. Cl.[2] C07C *118/00, 119/042, 119/048*

U.S. Cl. 260—453 P 8 Claims

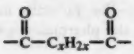
1. A process for converting a bis cyclic urea having the formula



into a diisocyanate having the formula

$$OCN—C_nH_{2n}—NH—R—NH—C_nH_{2n}—NCO$$

wherein C_nH_{2n} is the same in each formula and is alkylene from 4 to 12 inclusive and provided there are at least 4 carbon atoms in succession in the chain and R is the same in each formula and is a divalent radical selected from the group consisting of



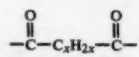
wherein C_xH_{2x} is alkylene from 1 to 8 inclusive, and

which process comprises heating said bis cyclic urea at a temperature sufficiently high to open both rings of said cyclic urea to form said diisocyanate.

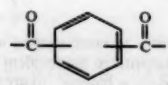
4. A diisocyanate having the formula

$$OCN—C_nH_{2n}—NH—R—NH—C_nH_{2n}—NCO$$

wherein C_nH_{2n} is alkylene from 4 to 12 inclusive and provided there are at least 4 carbon atoms in succession in the chain and R is a divalent radical selected from the group consisting of



wherein C_xH_{2x} is alkylene from 1 to 8 inclusive, and



4,190,600

PROCESS FOR THE MANUFACTURE OF M-HALOBENZOYL HALIDES

Franz Landauer, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,249

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743144

Int. Cl.[2] C07C *63/12*

U.S. Cl. 260—544 D 13 Claims

1. In a process for the preparation of m-halobenzoyl halides by chlorinating or brominating benzoyl chloride or benzoyl bromide in the absence of a solvent and in the presence of a catalyst and a cocatalyst, at a temperature of from about 0° to 90° C., the improvement comprising using as the catalyst $FeCl_3$ or $FeBr_3$ and as the cocatalyst sulfur, a sulfur halide, thioglycolic acid, thioacetic acid, thiphenol, thiophene, thiourea, or mixtures thereof.

4,190,601

PRODUCTION OF TERTIARY AMINES BY REDUCTIVE ALKYLATION

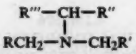
Quintin W. Decker, St. Albans, and Erich Marcus, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 31, 1978, Ser. No. 911,096

Int. Cl.[2] C07C *85/08*

U.S. Cl. 260—583 R 15 Claims

1. A process for the production of tertiary amines of the formula



which comprises the reductive alkylation at from 20° C. to 200° C. of (I) a secondary amine of the formula

with (II) a member from the group of the aliphatic aldehydes and the aliphatic ketones of the formula

where R and R′ can be:

(a) alkyl, substituted or unsubstituted, linear or branched, having from one to twenty carbon atoms;

or (b) a substituted or unsubstituted cycloalkyl having from four to eight ring carbon atoms;

or (c) a substituted or unsubstituted hydroxyalkyl, linear or branched, having from one to twenty carbon atoms;

or (d) a substituted or unsubstituted aralkyl having from seven to twenty carbon atoms;

or (e) hydrogen;

and R″ and R‴ singly can be:

(a) alkyl, substituted or unsubstituted, linear or branched, having from one to twenty carbon atoms;

or (b) hydrogen;

or (c) when taken together they can be alkylene having from three to six carbon atoms forming a cyclic ketone, in contact with hydrogen at a superatmospheric pressure, a water-segregating agent and a catalytically effective

amount, sufficient to carry out the reductive alkylation, of a hydrogenation catalyst.

4,190,602

MONOACETALS OR AROMATIC 1,2-DIKETONES

Jean Brunisholz, Monthey, and Rudolf Kirchmayr, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

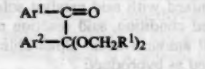
Division of Ser. No. 701,769, Jul. 2, 1976, abandoned, which is a division of Ser. No. 380,039, Jul. 17, 1973, abandoned. This application Jun. 22, 1978, Ser. No. 919,580

Claims priority, application Switzerland, Jul. 28, 1972, 11295/72; Jun. 28, 1973, 9417/73

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—590 D 3 Claims

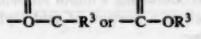
1. Process for the production of monoacetals of aromatic diketones of formula I



(I)

wherein R^1 represents hydrogen, alkyl having 1 to 5 carbon atoms, alkenyl having 2 or 3 carbon atoms, aralkyl having 7 to 9 carbon atoms, aralkenyl having 8 or 9 carbon atoms, or a group $-(CH_2)_n-X$,

wherein n represents a whole number from 1 to 3, and X denotes halogen, $-OR^3$, $-SR^3$, $-OAr^3$, $-SAr^3$



and R^3 represents alkyl having 1 to 4 carbon atoms, Ar^1, Ar^2 and Ar^3 each independently represent a phenyl radical unsubstituted, or at most trisubstituted by halogen, alkyl or alkoxy having 1 to 4 carbon atoms or by phenyl, which process comprises reacting an aromatic 1,2-diketone of the formula $Ar^1—CO—CO—Ar^2$ either with a sulphurous acid ester of the formula $(R^1CH_2O)_2SO$ in the presence of an anhydrous acid and a primary monoalcohol R^1CH_2OH at a temperature of about 20° to 120° C. or with thionyl chloride and a primary monoalcohol R^1CH_2OH at a temperature of from about 0° to 20° C. and subsequently heating to from about 20° to 120° C.

4,190,603

TRICYCLO[2.2.1.0^{2,6}]HEPTAN-3-ONES

Peter Funfschilling, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

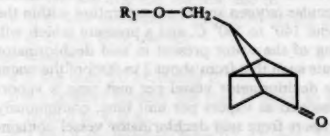
Division of Ser. No. 856,616, Dec. 2, 1977, Pat. No. 4,148,807, which is a division of Ser. No. 765,560, Feb. 4, 1977, Pat. No. 4,079,065. This application Nov. 20, 1978, Ser. No. 962,073

Claims priority, application Switzerland, Feb. 11, 1976, 1650/76

Int. Cl.[2] C07C *49/76*

U.S. Cl. 260—590 B 3 Claims

1. A compound of the formula



wherein R_1 is an acid stable group stable at a pH which is more acidic than pH 2.

4,190,604

PROCESS FOR PRODUCING DESOXY-α-ACIDS

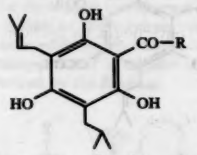
Urs Burckhardt, Basel, and Richard J. Troxler, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,129

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—592 5 Claims

1. A process for producing desoxy-α-acids of the formula I

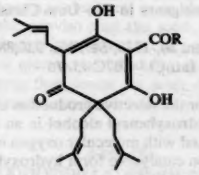


(I)

in which

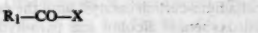
R represents a straight-chain or branched-chain alkyl group having 1 to 5 carbon atoms,

which process comprises converting a β-acid of the formula II



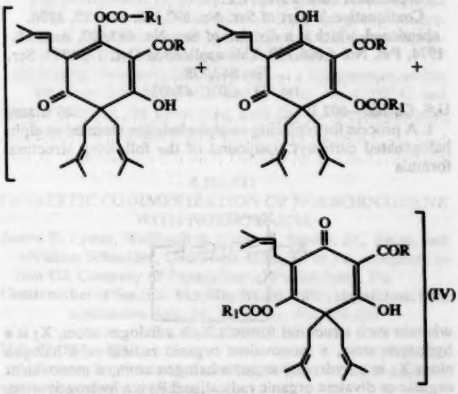
(II),

in which R has the meaning given under the formula I, by reaction with an acylating agent of the formula III



(III)

in which R_1 represents an alkyl group having 1 to 3 carbon atoms, and X represents chlorine, bromine or a group $R_1—CO—O—$, at a temperature of from 0°–50° C. when X is chlorine or bromine and at a temperature of from 50°–150° C. when X is $R_1—CO—O$, in the presence of a base, into a mixture of monoacylation products of the formula IV



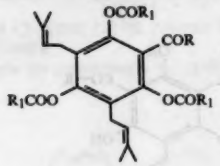
(IV)

in which R and R_1 have the meanings given under the formulae I and III; subsequently reacting this monoacylation product at

160° to 250° C., in the presence of from 0.1–10%, by weight of anhydride, of a carboxylic acid of the formula V

R_1COOH (V),

in which R_1 has the meaning given above, with an anhydride of such a carboxylic acid, with the splitting-off of isoprene, to give a triacyl compound of the formula VI



(VI),

in which R and R_1 have the aforesaid meanings; and then hydrolysing this compound at a temperature of from 0°–50° C. with aqueous alkali to yield a desoxy-α-acid of the formula I.

4,190,605

CATALYST ACTIVATION IN OXIDATION PROCESS

Wayne C. Muench; Glen O. Strand, and Thad S. Hormel, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1978, Ser. No. 920,883
Int. Cl.² C07C *45/16*
U.S. Cl. 260—600 R **6 Claims**

1. In the process for the selective production of hydroxybenzaldehyde where hydroxybenzyl alcohol in an alkaline aqueous medium is oxidized with molecular oxygen in the presence of a palladium-carbon catalyst to form hydroxybenzaldehyde, the improvement comprising conditioning the catalyst by reacting molecular oxygen with a sufficient quantity of feed comprising a mixture of orthohydroxybenzyl alcohol and para-hydroxybenzyl alcohol in an alkaline aqueous medium in the presence of said palladium-carbon catalyst until the rates of oxidation of orthohydroxybenzyl alcohol and para-hydroxybenzyl alcohol are nearly equal whereby the conditioned catalyst is activated and the product yield is increased.

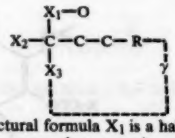
4,190,606

PROCESS FOR DEHALOGENATION AND/OR PREVENTION OF HALOGENATION

George A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 697,166, Jun. 17, 1976, abandoned, which is a division of Ser. No. 497,609, Aug. 15, 1974, Pat. No. 4,008,279. This application Oct. 17, 1977, Ser. No. 842,778
Int. Cl.² C07C *47/02*
U.S. Cl. 260—601 R **30 Claims**

1. A process for replacing an alpha halogen atom on an alpha halogenated carbonyl compound of the following structural formula



wherein such structural formula X_1 is a halogen atom, X_2 is a hydrogen atom, a monovalent organic radical or a halogen atom X_3 is a hydrogen atom, a halogen atom, a monovalent organic or divalent organic radical, and R_1 is a hydrogen atom, a hydroxyl group, a monovalent organic radical or a divalent organic radical, wherein when X_3 and R_1 are divalent organic radicals such are joined to each other so as to form a cyclic compound with a hydrogen atom, said process comprising causing there to be in an aqueous solution of said halogenated carbonyl compound at least one hydrogen ion in solution for each alpha halogen atom to be so replaced, and at least sufficient cuprous ions in solution to completely react with and be oxidized by any molecular oxygen present, plus at least two cuprous ions for each alpha halogen atom to be replaced, said process being conducted at a temperature within the range of about 70° to 250° C. and at pressure sufficient to maintain a liquid phase.

22. In a continuous conversion process for converting an alkene to an aldehydo alkane product, said aldehydo alkane being one which has a lower boiling point than water, which conversion process comprises the steps of:

(a) passing said alkene through an alkene reaction zone concurrently with an aqueous acidic oxidant catalyst solution comprising water containing dissolved there a noble metal oxidation catalyst, cupric ions, and chloride ions, whereby said alkene is oxidized to form a reaction product comprising predominantly said aldehydo alkane product admixed with said catalyst solution in a chemically reduced condition, said reaction product also containing small amounts of an alpha chlorinated aldehydo alkane formed as byproduct;

(b) separating said reaction product into fractions comprising (i) a crude aldehydo alkane product fraction which contains the major portion of said aldehydo alkane product and a portion of said alpha chlorinated aldehydo alkane, and, (ii) an aqueous reduced catalyst solution fraction containing said noble metal and copper in a reduced form, including cuprous chloride in solution and as cuprous chloride crystals, and also containing hydrochloric acid, and also containing a minor amount of said aldehydo alkane as well as a portion of said alpha chlorinated aldehydo alkane;

(c) separating said crude aldehydo alkane product fraction so as to recover therefrom an aldehydo alkane product of improved purity and an alpha chlorinated aldehydo alkane fraction;

(d) in a catalyst reoxidation zone reoxidizing said aqueous reduced catalyst solution fraction with a gas comprising molecular oxygen to oxidize a portion of the copper values contained therein to the cupric form; and

(e) recycling the resulting aqueous reoxidized catalyst solution to said alkene reaction zone;

the improvement which comprises passing said alpha chlorinated aldehydo alkane fraction to a dechlorinator vessel where it is mixed, in the absence of molecular oxygen, with a portion of said aqueous reduced catalyst solution fraction or a portion of said aqueous reoxidized catalyst solution and with an alkene corresponding to said alkene under such conditions as to cause dechlorination of at least a portion of the alpha chlorinated aldehydo alkane to a said aldehydo alkane and cause the said alkene to be oxidized to form a said aldehydo alkane, the amount of said aqueous reduced catalyst solution or the said aqueous reoxidized catalyst solution and the amount of said alkene passed to said dechlorinator vessel being such that there is caused to be in solution with said alpha chlorinated aldehydoalkane at least one hydrogen ion for each chlorine atom to be replaced in said dechlorination and at least two cuprous ions for each chlorine atom to be replaced in said dechlorination, said dechlorinator vessel being maintained free of molecular oxygen and at a temperature within the range of about 140° to 200° C. and a pressure which will effect boiling of the water present in said dechlorinator vessel at a rate such that from about 2 to 50% of the water entering the dechlorinator vessel per unit time is vaporized and removed as vapors per unit time; continuously removing vapors from said dechlorinator vessel containing vaporized water as well as vaporized aldehydo alkane, said vapors being treated to recover aldehydo alkane therefrom; and, continuously removing liquid from the

liquid phase of said dechlorinator vessel and passing same to said reoxidation zone.

4,190,607

METHOD FOR THE PREPARATION OF 2,3-DIMETHYL-PENT-4EN-ALDEHYDE

Frank J. Stiefel, Princeton Junction, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Sep. 29, 1978, Ser. No. 947,201
Int. Cl.[2] C07C *47/20*
U.S. Cl. 260—601 R 6 Claims

1. A method for preparing 2,3-dimethyl-pent-4en-aldehyde which comprises heating allyl crotyl ether at a temperature of 125°–136° C. and ambient pressure in the presence of a transition metal catalyst selected from the group consisting of molybdenum, palladium, rubidium and ruthenium.

3. A method for preparing 2,3-dimethyl-pent-4en-aldehyde which comprises adding a mixture of crotyl alcohol and allyl chloride to a condensing agent in a Solvent selected from the group comprising dimethyl formamide, dimethyl acetamide, toluene and/or benzene to produce allyl crotyl ether, heating said allyl crotyl ether at a temperature of 125°–136° C. and ambient pressure with a transition metal catalyst and selected from the group consisting of molybdenum, palladium, rubidium and ruthenium and recovering the 2,3-dimethyl pent-4en-aldehyde produced thereby.

4,190,608

PROCESS FOR THE OXIDATION OF OLEFINS USING CATALYSTS CONTAINING VARIOUS PROMOTER ELEMENTS

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 490,428, Jul. 22, 1974, Pat. No. 4,001,317. This application Aug. 26, 1976, Ser. No. 717,838
Int. Cl.[2] C07C *47/20, 51/20*
U.S. Cl. 260—604 R 10 Claims

1. In the process for the preparation of unsaturated aldehydes and acids from propylene or isobutylene by the vapor phase oxidation of propylene or isobutylene with molecular oxygen at a temperature of about 200° to 600° C. in the presence of a catalyst, the improvement comprising using as the catalyst a catalyst of the formula

$$X_aA_bD_cE_dFe_fBi_gMo_{12}O_x$$

wherein

X is at least one element selected from the group consisting of Y, Ru, Ga, and Zr;

A is at least one element selected from the group consisting of an alkali metal and Tl;

D is at least one element selected from the group consisting of Ni, Co, Mg, Zn, Cd, Ca, and Sr;

E is at least one element selected from the group consisting of P, As, B, S, and Al;

and wherein

a is less than 5.0 excluding 0;

b is a positive number less than or equal to 4; d is a number from 0 to 4; 0–4;

c, f and g are numbers from 0.1–12; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

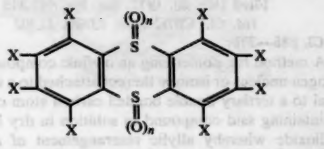
4,190,609

PROCESS FOR THE DIRECTED CHLORINATION OF XYLENES

Henry C. Lin, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 729,439, Oct. 4, 1976, Pat. No. 4,069,264. This application Dec. 30, 1977, Ser. No. 866,136
The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.
Int. Cl.[2] C07C *25/04*
U.S. Cl. 260—650 R 21 Claims

1. A process for the nuclear chlorination of xylene comprises reacting ortho-xylene or meta-xylene with chlorine in the presence of a Lewis acid catalyst and a co-catalyst comprising a thianthrene compound or a mixutre of thianthrene compounds characterized by the formula:



where n is 0 to 1, and each X is independently hydrogen, an electron-withdrawing substituent or an electron-donating substituent with the proviso that the total number of electron donating substituents is at least one and no more than four; the total number of electron-withdrawing substituents is at least one and no more than seven; no more than three electron-donating substituents are present at the peri-positions.

4,190,610

CATALYTIC CODIMERIZATION OF NORBORNADIENE WITH PENTADIENE

Harry K. Myers, Jr., Aston; James E. Lyons, Wallingford, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 819,441, Jul. 27, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,228
Int. Cl.[2] C07C *13/32*
U.S. Cl. 585—361 10 Claims

1. Process for the catalytic and codimerization of norbornadiene with 1,3-pentadiene comprising:

(a) contacting norbornadiene and 1,3-pentadiene in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of cobaltic or cobaltous acetylacetonate, 1,2-bisdiphenylphosphino ethane and an alkyl aluminum chloride selected from the group consisting of diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride:

(b) having the contacting occurring at a temperature within the range from between about 20° C. to about 100° C. and

(c) continuing the contacting until the 1,3-pentadiene-norbornadiene codimer is prepared.

4,190,611

CATALYTIC CODIMERIZATION OF NORBORNADIENE WITH NORBORNENE

James E. Lyons, Wallingford; Harry K. Myers, Jr., Aston, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 819,442, Jul. 27, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,230
Int. Cl.[2] C07C *13/32*
U.S. Cl. 585—361 10 Claims

1. Process for the catalytic codimerization of norbornadiene and norbornene comprising:

(a) contacting norbornadiene and norbornene in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of cobaltic or cobaltous

acetylacetonate, 1,2-bisdiphenylphosphino ethane and one of the following alkyl aluminum chlorides: diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range from between about 20° C. to about 100° C.; and

(c) continuing the contacting until the codimer of norbornadiene and norbornene is prepared.

4,190,612

REGIOSELECTIVE ISOMERIZATION AT CARBON ATOM VICINAL TO DOUBLY BONDED TERTIARY CARBON ATOM BY SULFUR DIOXIDE CATALYSIS

Divakaran Masilamani, Morristown, and Milorad M. Rogic, Whippany, both of N.J., assignors to Allied Chemical Corporation, MorrisTownship, Morris County, N.J.

Filed Dec. 20, 1977, Ser. No. 862,313

Int. Cl.[2] C07C *5/30, 13/20, 21/02*

U.S. Cl. 585—378 **14 Claims**

4. A method for isomerizing an olefinic compound having a hydrogen nucleus or isotope thereof attached to a carbon atom vicinal to a tertiary double bonded carbon atom comprising:

maintaining said compound as solution in dry liquid sulfur dioxide whereby allylic rearrangement of a hydrogen bond takes place.

4,190,613

SEPARATING AGENT FOR RUBBER POWDERS

Joachim Thörmer, Leverkusen; Jochen Schnetger, Odenthal-Hoeffe; Gerhard Giersiepen, Leichlingen, and Wilhelm Göbel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 811,144, Jun. 28, 1977, abandoned. This application Sep. 21, 1977, Ser. No. 835,298

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629705

Int. Cl.[2] C08L *9/02, 9/06, 11/00*

U.S. Cl. 525—215 **5 Claims**

1. A freeflowing rubber powder mixture which is stable against coalescence and cohesion comprising a vulcanisable rubber in powder form and from 3 to 12% by weight, based on the rubber, of polyacrylonitrile.

4,190,614

METHOD FOR THE PRODUCTION OF LOW DENSITY COPOLYMERS OF ETHYLENE

Akira Ito, and Kenji Iwata, both of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 4, 1977, Ser. No. 784,308

Claims priority, application Japan, Apr. 13, 1976, 51-40888

Int. Cl.[2] C08F *4/02, 255/02*

U.S. Cl. 525—106 **11 Claims**

1. A method for the production of a low density copolymers of ethylene and α-olefins having a density of 0.925 to 0.950 g/ml and a bulk density of more than 0.35 g/ml by copolymerizing ethylene and an α-olefin, which comprises:

(1) using a catalyst consisting of (A) titanium and/or vanadium compounds selected from the transition metal component of a Ziegler catalyst supported with a magnesium compound and (B) an organoaluminum compound,

(2) subjecting ethylene to a pre-polymerization in a liquid diluent in the presence of said catalyst prior to in the copolymerization, the amount of ethylene to be prepolymerized being more than 50 g per 1.0 g of said catalyst component (A) and not more than 20% by weight of the entire amount of the ethylene and α-olefin monomers to be polymerized, and

(3) successively, conducting the copolymerization of ethylene and an α-olefin at temperatures of not higher than 100° C. in the presence of a low-boiling hydrocarbon diluent having a boiling point of not higher than 40° C.

4,190,615

OLIGOMERIC ESTER CHAIN CONDENSATES OF SUBSTITUTED 1-HYDROXY-1,1-DIPHOSPHONIC ACID

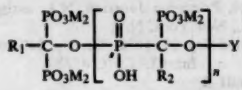
Larry W. Becker, Wilmington, Del., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 11, 1978, Ser. No. 941,537

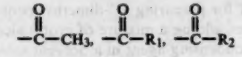
Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—931 **5 Claims**

1. A compound having the formula



where M is a water soluble cation; R_1 and R_2 each represent a group having the formula C_xH_{2x+1}; x is from 6 to and including 13; Y is



or hydrogen; and n is 1 or greater.

4,190,616

PHOSPHINITE AND PHOSPHONITE COMPOUNDS

James R. Jennings; Philip J. Hogan, and Lawrence F. M. Kelly, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 841,924, Oct. 13, 1977, Pat. No. 4,138,428. This application Oct. 17, 1978, Ser. No. 952,138

Claims priority, application United Kingdom, Oct. 21, 1976, 45324/76; Oct. 21, 1976, 52888/76; Apr. 12, 1977, 15029/77

Int. Cl.[2] C07F *9/46, 9/48*

U.S. Cl. 260—945 **1 Claim**

1. A compound selected from the group consisting of isopropyl bis p-isopropoxyphenylphosphinite, isopropyl phenyl (p-methoxyphenyl)phosphinite, isopropyl phenyl (p-isopropoxyphenyl)phosphinite, isopropyl phenyl (p-dimethylaminophenyl)phosphinite, isopropyl phenyl (p-tertiarybutoxyphenyl)phosphinite, di-isopropyl p-isopropoxyphenylphosphonite, di-ethyl p-isopropoxyphenylphosphinite, cyclohexyl bis p-methoxyphenylphosphinite, isopropyl phenyl (p-diethylaminophenyl) phosphinite, isopropyl bis p-methoxyphenylphosphinite, isopropyl bis dimethylaminophenylphosphinite, isopropyl phenyl (p-tertiarybutylphenyl)phosphinite, di-isopropyl p-methoxyphenylphosphonite, di-isopropyl p-dimethylaminophenylphosphinite, and di-ethyl p-dimethylaminophenylphosphonite.

4,190,617

MIXING PUMP SYSTEM

Henry F. Hope, 3192 Huntingdon Rd., Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Aug. 7, 1978, Ser. No. 931,407

Int. Cl.[2] B01F *7/16, 15/06*

U.S. Cl. 261—28 **49 Claims**

1. In a system for circulating and homogeneously mixing a plurality of fluids:

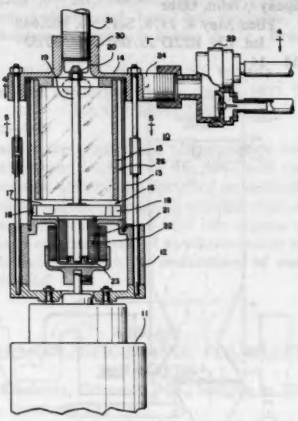
a cylindrical chamber having near one end an impeller rotatable about the axis of the chamber,

an inner cylinder concentric within the chamber,

which cylinder extends to the end of the chamber at the end remote from the impeller and defines an opening with the chamber at the end nearest the impeller,

means for introducing the fluids into the annular space between the chamber wall and the inner cylinder to cause these fluids to flow inwardly into the inner cylinder in the region of the impeller,

means for rotating the impeller to cause an alteration of the fluid at least in the region of the impeller,



means for the passage of fluid from within the inner cylinder to the outside of the system, and

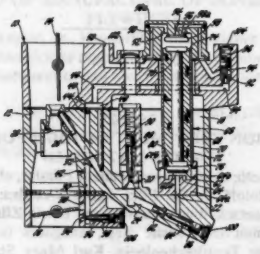
whereby homogeneous mixing of the fluids is accomplished.

4,190,618

CARBURETOR

Timothy K. Sheffer, Churchville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1979, Ser. No. 17,080
Int. Cl.² F02M 7/16
U.S. Cl. 261—50 R **6 Claims**



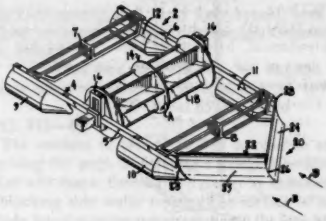
1. A carburetor comprising main and idle fuel passages, a metering orifice in said main fuel passage, an air bleed opening into said idle fuel passage, and a metering apparatus reciprocable between a rich position and a lean position, said metering apparatus including a metering valve engaged with said metering orifice in said lean position to restrict fuel flow through said main fuel passage and displaced from said metering orifice in said rich position to permit increased fuel flow through said main fuel passage, said metering apparatus further including a bleed valve engaged with said air bleed in said rich position to restrict air flow through said air bleed and thereby permit increased fuel flow through said idle fuel passage and displaced from said air bleed in said lean position to permit increased air flow through said air bleed and thereby restrict fuel flow through said idle fuel passage, wherein said valves are permanently magnetic, and wherein said carburetor further comprises an electromagnet pole member associated with said valves, an electromagnet coil surrounding said pole member for causing said pole member to drive said valves to one of said rich and lean positions when said coil is energized, and permanent magnet means for biasing said valves to the other of said rich and lean positions when said coil is deenergized.

4,190,619

LIQUID AERATING ROTOR ASSEMBLY

Lloyd G. Cherne, Edina, Minn., assignor to Cherne Industries, Inc., Edina, Minn.

Filed Jul. 17, 1978, Ser. No. 924,886
Int. Cl.² B01F 7/04
U.S. Cl. 261—92 **3 Claims**



1. An improved liquid aerating rotor assembly for aeration of liquid during relative movement of the liquid and the rotor assembly along a desired path, wherein the rotor assembly is of the type which comprises a support frame; a rotor rotatably supported on the support frame for rotation about a horizontal axis, the rotor having means for aerating the liquid as it rotates; power means for rotating the rotor about its axis; and means for supporting the support frame on the surface of the liquid, and wherein the improvement comprises means for directing sub-surface liquid to the rotor for mixing and aerating the sub-surface liquid which is substantially free of large floating debris, wherein the directing means comprises a scoop having:

(a) an inlet end located beneath the surface of the liquid;

(b) an outlet end located above the surface of the liquid and adjacent to and surrounding the rotor; and

(c) an enclosed vertical body section which fluidically connects the inlet and outlet ends to form the scoop, wherein the vertical body section extends above the surface of the liquid to surround the rotor and form a pool of liquid contained inside the vertical body section which the rotor can contact and aerate, and wherein the liquid in the pool is constantly replenished during rotation of the rotor with sub-surface liquid which is drawn in through the inlet end and conducted through the vertical body section into the pool by rotation of the rotor.

4,190,620

DEVICE FOR GENERATING SUPER ATMOSPHERIC PRESSURES OF SENSITIVE MATERIALS IN A GAS STREAM

Thomas H. Vanderspurt, Gillette, N.J., and Paul D. Taylor, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,750
Int. Cl.² B01F 3/04
U.S. Cl. 261—148 **6 Claims**

1. An apparatus for converting a stream of sensitive organic material from a liquid state to a vapor state in combination with a carrier gas, comprising:

A. a tower having:

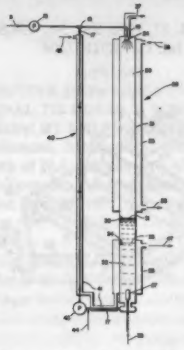
1. a vaporization stage in the upper part thereof,
2. a stripping stage in the lower part thereof,
3. a heating means for said vaporization stage, and
4. a cooling means for said stripping stage;

B. an inlet means for introducing said liquid sensitive material at an elevated pressure to the top of said tower;

C. an inlet means for introducing said carrier gas into the bottom of said tower;

D. an outlet means for removing combined carrier gas and vaporized sensitive material from said vaporization stage;

E. a recirculating line for transferring the contents of said stripping stage to said liquid inlet means; and



F. a cooling means for cooling the contents of said recirculating line.

4,190,621

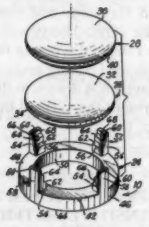
METHOD FOR MOLDING OPTICAL PLASTIC LENSES OF THE STANDARD AND BIFOCAL TYPE

Martin Greshes, 70 Corey La., East Meadow, N.Y. 11554

Continuation-in-part of Ser. No. 776,129, Mar. 10, 1977, abandoned. This application Jun. 27, 1977, Ser. No. 810,357

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 **38 Claims**



24. A method of producing an ophthalmic toric bifocal lens comprising the steps of

supporting a bifocal lower mold having a recessed bifocal well area on its concave surface,

filling said lower mold with a resin material,

positioning an upper mold in vertically and selectively spaced relationship to said lower mold, whereby said resin material is displaced to extend between the overlapping surfaces of said molds to form the configuration of said bifocal lens with a bifocular portion on the convex lens surface corresponding to said bifocal well on said lower mold,

curing said resin material situated between said molds,

cooling said resin material and said molds, whereby said lower mold is capable of movement to compensate for shrinkage of said resin material, and

separating said bifocal lens from between said molds.

4,190,622

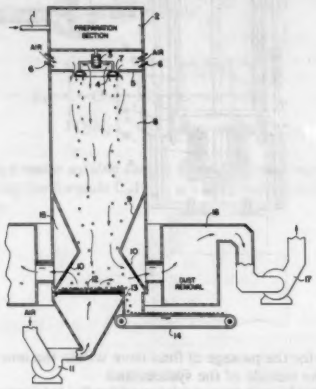
PROCESS FOR PRILLING UREA

Norris J. Landis, Cleveland Heights, Ohio, assignor to Standard Oil Company (Ohio), Ohio

Filed May 4, 1978, Ser. No. 903,648

Int. Cl.[2] B22D *23/08*; C05C *9/00*

U.S. Cl. 264—14 **8 Claims**



1. A process for prilling a material in a tower wherein droplets of molten material fall through a first zone and are contacted co-currently with a first gas stream and at least partially solidifying said material thereby forming a prill, and cooling and collecting said prills in a second zone comprising a fluid bed, said bed being maintained by a second gas stream flowing countercurrent to the first gas stream, wherein both first and second gas stream exit near the bottom of the tower.

4,190,623

RADIATION TREATMENT OF HIGH-POLYMER TEXTILE MATERIALS

Wolfgang Bobeth; Adolf Heger; Helmar Pässler, all of Dresden; Hermann Roloff, Berlin; Ellen Patitz, Dresden; Adolf-Ernst Schwind, Deutsch-Wusterhausen, and Erwin Zilinski, Berlin, all of German Democratic Rep., assignors to Forschungs Institut Fuer Textiltechnologie, Karl Marx Stadt, German Democratic Rep.

Continuation-in-part of Ser. No. 141,167, May 7, 1971, abandoned, Division of Ser. No. 473,303, May 24, 1974. This application Apr. 9, 1975, Ser. No. 566,334

The portion of the term of this patent subsequent to Feb. 6, 1995, has been disclaimed.

Int. Cl.[2] B01D *47/00*; B01F *3/04*

U.S. Cl. 264—22 **18 Claims**

1. The process of texturing a high polymer textile material comprising the steps of moving a beam of homogeneous high energy irradiation so as to impinge upon the material and to cause formation of chemically active species in said material, subjecting selected localized surface areas of the material to a heat treatment prior to or after said irradiation for a sufficient time to destroy or prevent the formation of said active species in said areas; and finally treating the material with a shrinking medium by reaction with said chemically active species so as to cause a differential shrinkage between said heat treated and said non-heat treated areas and thus accomplishing a texturing effect.

4,190,624

PROCESS FOR THE EXTRUSION OF COMPOSITIONS BASED ON ALPHA-OLEFIN POLYMERS

Joseph Alard, Andenne, and Jean-Louis Derroitte, Mormont, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Jun. 5, 1978, Ser. No. 912,071
Claims priority, application France, Jun. 7, 1977, 77 17978
Int. Cl.[2] B29D *7/20*
U.S. Cl. 264—146 11 Claims

1. Process for the extrusion of a composition based on an alpha-olefin polymer, followed by a cooling with water of the extruded material, comprising: extruding an alpha-olefin composition which comprises stabilizing amounts of (a) at least one phenolic anti-oxidant and (b) at least one organic phosphite; and (c) at least one carbonate of an alkaline-earth metal in an amount effective to reduce the entrainment of water by the extruded material.

4,190,625

THERMOPLASTIC ELASTIC POLYSULFIDE POLYMERS

Stuart M. Ellerstein, Princeton, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 704,010, Jul. 9, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,299
Int. Cl.[2] B28B *3/20*
U.S. Cl. 264—176 R 1 Claim

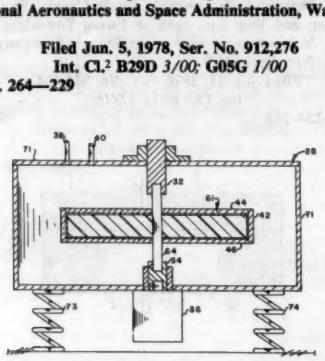
1. A process for the preparation of a shaped thermoplastic elastomeric article of manufacture which comprises the extrusion of a cured polysulfide rubber, said polysulfide rubber having sulfur linkages averaging at least 1.8 sulfur atoms per linkage unit and, containing a catalytic amount of an alkali metal hydroxide, through a die under heat and pressure and allowing the extrudate to cool to room temperature.

4,190,626

METHOD OF MANUFACTURE OF BONDED FIBER FLYWHEEL

George M. Weyler, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 5, 1978, Ser. No. 912,276
Int. Cl.[2] B29D *3/00*; G05G *1/00*
U.S. Cl. 264—229 7 Claims



1. The method of constructing a flywheel comprising:
forming a desired dimensioned, round, cylindrically-shaped, matrix of layered, glass fiber cloth within a cylindrical case, and there being an uncured fiberglass bonding material covering the fibers of the cloth and between layers of cloth and filling the case;
placing a vertically positioned axle concentrically through said round matrix;
while said bonding material is still in an uncured state, placing said case within a curing chamber with said axle rotably supported;
rotably driving said axle, whereby fibers of said matrix are stressed by centrifugal force; and
while said matrix is so rotably driven, applying a desired degree of heat to said matrix and effecting the curing of said bond material with fibers of said matrix in a stressed state, and fibers of said matrix becoming bonded together and to said axle.

4,190,627

METHOD OF PRILLED SULPHUR STORAGE IN THE OPEN AREA

Halina Leszczynska, and Jerzy Leszczynski, both of Warsaw, Poland, assignors to Instytut Przemysku Organicznega, Warsaw, Poland

Filed Oct. 20, 1978, Ser. No. 952,933
Claims priority, application Poland, Oct. 28, 1977, 201816
Int. Cl.[2] B65G *65/28, 69/16*
U.S. Cl. 422—40 2 Claims

1. The method of storing prilled sulphur in an open area comprising the steps of forming a dump of prilled sulphur of any size and shape, limiting said dump by immovable or movable blocking side walls, treating the surface of said dump to preclude liquid sulphur penetration into the interior thereof by covering said surface with a layer of crushed sulphur and then spraying said dump with liquid sulphur to form a protective layer of solidified sulphur thereon.

2. The method of storing prilled sulphur in an open area comprising the steps of forming a dump of prilled sulphur of any size and shape, limiting said dump by immovable or movable blocking side walls, treating the surface of said dump to preclude liquid sulphur penetration into the interior thereof by spraying said surface with water at a temperative equal to or lower than the ambient temperature and then spraying said dump with liquid sulphur to form a protective layer of solidified sulphur thereon.

4,190,628

KIT FOR DETERMINING THE LEVEL OF LDL CHOLESTEROL IN BODY FLUIDS

Barry D. Sears, Marblehead, Mass., assignor to Trustees of Boston University, Boston, Mass.

Continuation-in-part of Ser. No. 853,598, Nov. 21, 1977, Pat. No. 4,126,416. This application Oct. 26, 1978, Ser. No. 955,279
Int. Cl.[2] G01N *33/16, 31/02*
U.S. Cl. 422—61 6 Claims

1. A diagnostic kit for detecting LDL cholesterol in a body fluid containing LDL cholesterol and another form of cholesterol selected from VLDL cholesterol, HDL cholesterol, and combinations thereof comprising, in combination:
a. a reagent containing a lectin which is a specific agglutinating agent for LDL whereby LDL contained in said body fluid can be selectively agglutinated; and,
b. a reagent for determining the amount of cholesterol in said specifically agglutinated LDL.

4,190,629

EMISSION CONTROL APPARATUS FOR DIESEL ENGINES

John B. Strachan, Wamberal, Australia, assignor to Domino Equipment Pty. Ltd., New South Wales, Australia

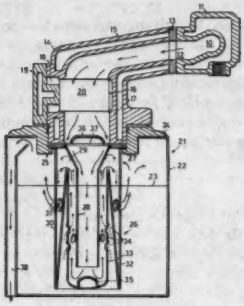
Filed Nov. 28, 1977, Ser. No. 855,433
Int. Cl.[2] F01N *3/02, 3/08, 3/15*
U.S. Cl. 422—169 3 Claims

1. An emission control apparatus for a diesel engine for use in gaseous mining applications comprising an adaptor which is jacketed for cooling by circulated water; a purifier chamber within the adaptor; an inlet to the said chamber for connection to the outlet from the exhaust manifold of a diesel engine; an outlet from the said chamber; a catalytic purifier within the said chamber for reduction of carbon monoxide of exhaust gases passing from the said inlet through the said chamber to the said outlet; a water scrubber comprising a casing to contain

a quantity of water; an inlet to the casing of the water scrubber connected to the outlet from the said purifier chamber; a domed baffle positioned between said outlet from said purifier chamber and the inlet to said water scrubber; a two-pass scrubber unit within the casing connected to the inlet to the casing and adapted to direct exhaust gases on a circuitous path through water in the casing, said scrubber unit including:

a central tube extending downwardly from the top of the casing and surrounding the casing inlet to a position below the water level of the casing;

(ii) an inner perforated tube disposed coaxially about the central tube with perforations below the water level, its upper end above the water level, its lower end closed and below the lower end of the central tube;



(iii) a dome secured to the lower end of said inner perforated tube and adapted to direct gases exiting downwardly from said central tube in an upward direction through said inner perforated tube;

(iv) an outer perforated tube secured to the top of the casing and surrounding the casing inlet and disposed coaxially about the inner perforated tube and with perforations below the water level, and

(v) an upwardly tapered tubular baffle with its lower end secured and sealed to that of the outer perforated tube and its upper end secured and sealed to that of the inner perforated tube.

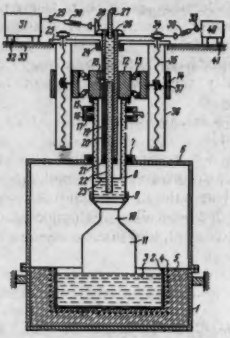
4,190,630

APPARATUS FOR PULLING SINGLE CRYSTALS FROM MELT

Vitaly Y. Apilat; Marx I. Litichevsky; Oleg S. Mjulendorf, and Lev G. Eidelman, all of Kharkov, U.S.S.R., assignors to Vsesojuzny Nauchno-Issiekovatelsky Institut Monokristallov Stsintillyatsionnykh Materialov I Osobo Chistykh Khimicheskikh Veschestv, Kharkov, U.S.S.R.

Filed Jan. 3, 1978, Ser. No. 866,812
Int. Cl.[2] B01J *17/18*
U.S. Cl. 422—249 **4 Claims**

1. An apparatus for pulling single crystals from melt comprising: a hollow rod having a seed crystal holder; carriage means in which said rod is mounted for axially moving said rod in a reciprocating manner with said seed crystal along a vertical axis; first drive means for moving said carriage means in a reciprocating manner; second drive means for rotating said rod in said carriage means, said second drive means including a drive shaft located and extending within said hollow rod coaxially therewith defining a space therebetween; means for rotating said drive shaft; means for engaging said rod and said drive shaft for combined rotation of both said drive shaft and said rod about the longitudinal axis of said drive shaft and for axial reciprocating movement of said rod with said carriage with respect to and axially along said drive shaft, said engagement means comprising a radially extending pin rigidly secured at one end to the rod and a longitudinally extending groove provided in the outer periphery of the drive shaft receiving for slidable movement therein the free end of the pin; a sleeve disposed in said space between the rod and the drive shaft surrounding a substantial portion of the length of the drive



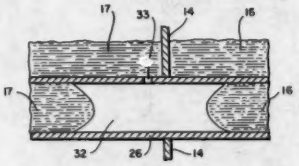
shaft; a pipe longitudinally extending within said drive shaft rigidly secured to the rod; and means for providing circulation of coolant within the space between the sleeve and the rod.

4,190,631

DOUBLE CRUCIBLE CRYSTAL GROWING APPARATUS

Thomas J. Dewees, Falls Township, Bucks County, Pa.; John S. Fangman, and Wen Lin, both of Ewing Township, Mercer County, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,454
Int. Cl.[2] B01J *17/18*
U.S. Cl. 422—249 **5 Claims**



1. An apparatus for growing a single crystal semiconductor billet, comprising:

first and second chambers, each adapted to contain a semiconductor melt; and

a hollow interconnecting member, communicating between the chambers to permit flow of the melt from the first to the second chamber and being of such a length as to inhibit back diffusion of the melt therethrough, the member having at least one aperture extending through the wall thereof to permit the escape of gas within the member while substantially precluding the flow of melt therethrough.

4,190,632

PROCESS FOR TREATING AIR-BORNE (METALLIC) DUSTS CONTAINING SILICON DIOXIDE TO FORM PRECIPITATED SILICIC ACIDS AND SILICATES

Karl Achenbach, Frankfurt, and Gunter Turk, Hanau, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 775,217

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609831

Int. Cl.² C01B *33/26, 33/12*

U.S. Cl. 423—118 8 Claims

1. A process for treating air-borne dust containing silicon dioxide in order to convert the silicon dioxide into a silicic acid or a silicate, wherein the air-borne dust is a waste product from a silicon metal or silicon alloy production process and is harmful to the environment, said process comprising the following stages:

Stage I. Dissolving said air-borne dust in an alkali metal hydroxide solution at a temperature of about 60° to about 110° C. in order to form an alkali metal silicate solution having a high modulus (SiO_2:alkali metal oxide);

Stage II. Purifying said alkali metal silicate solution during or after Stage I by treating said solution with activated charcoal and at least one oxidation agent, separately or in admixture, said oxidation agent being selected from hydrogen peroxide and alkali metal peroxide, in order to remove organic compounds from said solution and to form a non-decomposable residue and separating said non-decomposable residue from said alkali metal silicate solution;

Stage III. (A) Reacting said alkali metal silicate solution with at least one acid, aluminum salt, magnesium salt, calcium salt, or mixtures of said acids and salts, at a temperature of about 60° to about 110° C. and at a pH of about 1 to about 12 to thereby form a precipitate;

(B) Filtering, washing, drying and comminuting said precipitate to form a finely divided, amorphous, substantially pure, precipitated silicic acid or silicate having a whiteness according to Berger at a wave length of 460 mμ of about 90 to about 95% and a specific surface area of about 30 to about 800 m^2/g BET.

4,190,633

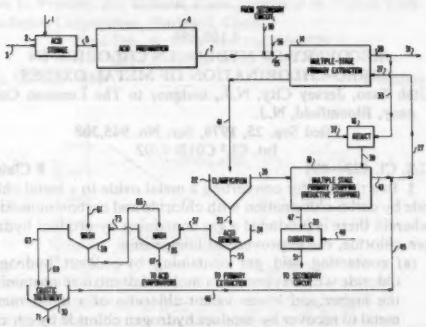
CRUD HANDLING CIRCUIT

Jay C. Smith, Gonzales; Ronald J. Manuel, Prairieville, and James E. McAllister, Baton Rouge, all of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,947

Int. Cl.² C01B *25/16*

U.S. Cl. 423—321 S 7 Claims



1. A process for treating semi-floatable, crud-forming material formed during the extraction of dissolved constituents from aqueous wet process phosphoric acid phase using an organic solvent extractant phase, comprising the steps of:

(a) operating the solvent extraction stages of the process to allow the formation of the semi-floatable crud material;

(b) removing at least a portion of the semi-floatable crud material, together with a portion of the solvent, from said stages; and,

(c) separating the removed solvent from the semi-floatable crud material by the steps of:

(i) clarifying the removed solvent and semi-floatable crud material to remove organic material therefrom;

(ii) subjecting the underflow from the clarification step to a settling process to remove acid therefrom;

(iii) washing the solvent and semi-floatable crud material in amounts sufficient to further remove acid therefrom; and;

(iv) mixing the solvent and semi-floatable crud material with an aqueous caustic solution containing between 0.2–2.0% NaOH (by weight) and between 0–3% Na_2CO_3 (by weight) wherein the mixture of crud and caustic has a pH of between 4.5 and 11.0, in an amount sufficient to remove the solvent from the semi-floatable crud material and regenerate said solvent.

4,190,634

PURIFYING PHOSPHORIC ACID BY EXTRACTION WITH AN ALIPHATIC NITRILE

William A. Feiler, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 8, 1978, Ser. No. 904,066

Int. Cl.² C01B *25/22*

U.S. Cl. 423—321 S 7 Claims

1. In the process for removing at least a portion of the impurities from impure aqueous phosphoric acid solutions containing at least 30% by weight of phosphoric acid by the successive steps of:

contacting the impure acid with a substantially water-insoluble solvent whereby a portion of the phosphoric acid is extracted into the solvent, forming a loaded solvent phase;

separating the solvent phase from the remaining materials;

contacting the solvent phase with water whereby a portion of the phosphoric acid is extracted into the water, forming an aqueous phosphoric acid solution of increased purity;

and separating the aqueous acid thus formed from the remaining materials;

wherein the improvement comprises contacting the impure acid with at least one aliphatic nitrile of from 4 to 10 carbon atoms in an amount effective to extract a portion of the phosphoric acid to form a loaded solvent phase with a smaller proportion of iron than the impure aqueous phosphoric acid solution.

4,190,635

PROCESSES FOR PREPARING SODIUM PERCARBONATE

Louis Mésaros, Oullins, and Paul Mollard, Sainte Foy les Lyon, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 11, 1978, Ser. No. 868,680

Claims priority, application France, Feb. 11, 1977, 77 03856

Int. Cl.² C01B *15/10*

U.S. Cl. 423—415 P 5 Claims

1. A process for the production of sodium percarbonate, $2Na_2CO_3.3H_2O_2$, which process comprises providing a reaction mixture of solid sodium carbonate monohydrate a hydrated sodium carbonate containing from 75 to 90 percent Na_2CO_3 and 60 to 80 percent aqueous hydrogen peroxide, the reaction mixture containing a small but effective quantity of a nonionic surfactant, the surfactant being stable in concentrated solutions of hydrogen peroxide and alkaline sodium carbonate solutions, and forming sodium percarbonate, the apparent

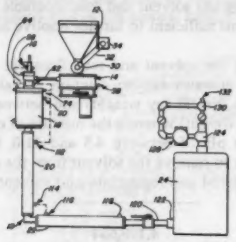
density of the solid sodium carbonate monohydrate or hydrated sodium carbonate being 0.985 g/cm^3 or greater.

4,190,636

PRODUCTION OF CARBON MONOXIDE IN A PLASMA ARC REACTOR

Donald W. Schmerling, York, and Frederick Giacobbe, Hanover, both of Pa., assignors to Chemetron Corporation, Chicago, Ill.

Filed Sep. 26, 1978, Ser. No. 945,991
Int. Cl.^{2} C01B *31/18*
U.S. Cl. 423—415 A **5 Claims**



1. A method of producing carbon monoxide comprising the steps of:

delivering a first stream of carbon dioxide to an arc to form a plasma,

delivering solid carbon to the plasma, at least a portion of said solid carbon delivered to the plasma from an electrode of solid carbon, and at least a portion of said solid carbon delivered to the plasma in powdered form, said solid carbon powder carried by a second stream of carbon dioxide and injected into the plasma ahead of the arc, and

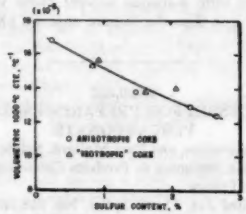
quenching the resultant products.

4,190,637

GRAPHITE HAVING IMPROVED THERMAL STRESS RESISTANCE AND METHOD OF PREPARATION

Charles R. Kennedy, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 18, 1978, Ser. No. 925,721
Int. Cl.^{2} C01B *31/04*
U.S. Cl. 423—448 **10 Claims**



1. A method for fabricating a graphite article comprising the steps of:

(a) providing a first coke article containing 1–3 wt.% sulfur and no added puffing inhibitors;

(b) impregnating said first coke article with a thermoplastic pitch by first heating said first coke article in contact with said thermoplastic pitch at a temperature within the range of 250°–300° C. at a pressure within the range of 200–2000 psig for at least 4–10 hours, and then heating said article at a temperature within the range of 465°–485° C. at a pressure of 200–2000 psig for about 16–24 hours to provide an impregnated article;

(c) heating said impregnated article for sufficient time to carbonize the impregnant to provide a second coke article; and

(d) graphitizing the second coke article at a temperature above the temperature at which puffing occurs.

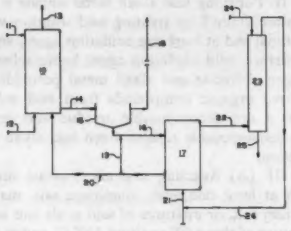
9. A graphite article characterized by a density at least 1.75 gm/cm^3, a fracture strain of at least 1%, a 1000° C. coefficient of thermal expansion less than 5.5 × 10^{-6}° C.$^{-1}$, a thermal stress resistance of at least 0.2%/(°C.$^{-1}$ × 10^6) and a Bacon Anisotropy factor less than 1.25.

4,190,638

PRODUCTION OF HYPOCHLOROUS ACID

Howard H. Hoekje, Corpus Christi, Tex., and Russell R. May, Wadsworth, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 7, 1978, Ser. No. 913,402
Int. Cl.^{2} C01B *11/04*
U.S. Cl. 423—473 **6 Claims**



1. A continuous process for preparing hypochlorous acid comprising the steps of:

(a) contacting cathode cell liquor with carbon dioxide containing gas to produce a wet, hydrated sodium carbonate-sodium bicarbonate precipitate;

(b) feeding the wet precipitate to a fluid bed reactor and contacting the precipitate with a countercurrent flow of a mixture of gaseous chlorine and water vapor at a rate sufficient to maintain the bed of precipitate in a fluidized condition, where the molar ratio of water vapor to chlorine gas in the mixture fed to the fluid bed reactor is from about 0.5:1 to 0.9:1;

(c) recycling a portion of precipitate that had been dried by contact with the gaseous mixture and mixing said portion with wet precipitate being fed to the fluid bed reactor; and

(d) absorbing the gaseous effluent from the fluid bed reactor in water.

4,190,639

RECOVERY OF HYDROGEN CHLORIDE IN CARBO-CHLORINATION OF METAL OXIDES

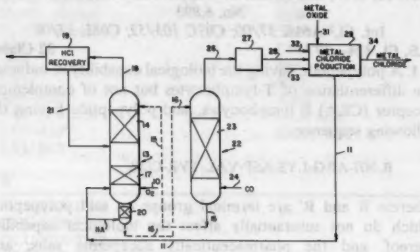
Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Sep. 25, 1978, Ser. No. 945,308
Int. Cl.^{2} C01B *9/02*
U.S. Cl. 423—491 **8 Claims**

1. In a process for converting a metal oxide to a metal chloride by carbo-chlorination with chlorine and carbon monoxide wherein there is produced a gas containing by-product hydrogen chloride, the improvement comprising:

(a) contacting said gas containing by-product hydrogen chloride with oxygen and a molten salt mixture containing the higher and lower valent chlorides of a multi-valent metal to recover by-product hydrogen chloride by enriching the molten salt mixture in the higher valent metal chloride;

(b) contacting molten salt from step (a) with at least a portion of the carbon monoxide to be employed as fresh feed in said carbo-chlorination, said contacting being effected to recover essentially all of the chlorine values added to said molten salt mixture in step (a) by both stripping of gaseous chlorine from the salt and reaction to produce phosgene;



(c) recovering from step (b) carbon monoxide, chlorine and phosgene; and

(d) employing recovered carbon monoxide chlorine and phosgene in said carbo-chlorination of a metal oxide to a metal chloride.

4,190,640

GENERATION OF NASCENT BROMINE FOR USE IN THE GROWTH OF ULTRA PURE METAL BROMIDES

Ricardo C. Pastor, Manhattan Beach, and Antonio C. Pastor, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 4, 1978, Ser. No. 965,802
Int. Cl.[2] C01B *7/10*
U.S. Cl. 423—500 **4 Claims**

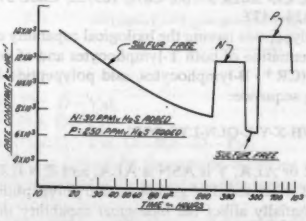
1. A process for the generation of nascent bromine at temperatures above 600° C. comprising the steps of first providing a reactive carrier gas comprised of an inert gas selected from the group consisting of N_2, He and Ar, and a reactive gas comprised of NO, or NO_2, passing said carrier gas over a nascent bromine source compound selected from a group consisting of CBr_4, $CHBr_3$ and CH_2Br_2 whereby the vapors of said bromine source compound are entrained in and mixed with said carrier gas, and passing said carrier gas containing said entrained bromine vapors into a pyrolysis chamber set to a preselected temperature greater than 600° C. whereby said bromine source compound will dissociate into nascent Br.

4,190,641

METHOD FOR PRODUCING HYDROGEN

John L. Preston, Jr., Hebron, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1978, Ser. No. 966,929
Int. Cl.[2] C01B *1/02, 1/18*
U.S. Cl. 423—653 **8 Claims**



1. A method for producing hydrogen including the step of shift converting a hydrogen containing gas stream under a given set of conditions of length of time, flow rate, temperature, pressure, moles steam to moles carbon ratio, and inlet CO concentration using a chromia stabilized iron oxide shift catalyst, wherein the hydrogen sulfide content of the gas stream is maintained between 20 ppm and 520 ppm on a dry gas volume basis, but in no event more than that which would result in the conversion of the iron oxide to iron sulfide under said given conditions, and wherein the step of shift converting comprises reducing the carbon monoxide concentration of said gas stream to less than p% by volume using an amount "A" of said shift catalyst which is no greater than about two-thirds the minimum amount "B" which would be required under said given set of conditions if there were no hydrogen sulfide in said gas stream.

4,190,642

OCULAR THERAPEUTIC SYSTEM FOR DISPENSING A MEDICATION FORMULATION

Robert M. Gale, Mt. View; Monique Ben-Dor, and Nancy Keller, both of Palo Alto, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 896,720, Apr. 17, 1978. This application May 11, 1979, Ser. No. 38,086
Int. Cl.[2] A61K *9/22, 9/24, 9/50, 9/52*
U.S. Cl. 424—19 **11 Claims**

1. An ocular therapeutic system for dispensing a medication formulation to an eye, said system sized, shaped and adapted for easy insertion and comfortable retention in the eye and comprising, depots of a medication formulation consisting essentially of from 1 to 40 weight percent of a pilocarpine therapeutically acceptable salt of 0.1 to 100 micron size and 1 to 25 weight percent of an epinephrine therapeutically acceptable salt of 0.1 to 100 micron size, said depots dispersed in and surrounded substantially individually by a polymer that is impermeable to the passage of the medication formulation and permeable to the passage of eye fluid.

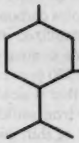
4,190,643

COMPOSITIONS HAVING A PHYSIOLOGICAL COOLING EFFECT

Hugh R. Watson, Wargrave, England; David G. Rowsell, View Bank, Australia, and David J. Spring, Slough, England, assignors to Wilkinson Sword Limited, London, England

Continuation-in-part of Ser. No. 486,564, Jul. 8, 1974, Pat. No. 4,136,163, which is a continuation-in-part of Ser. No. 221,755, Jan. 28, 1972, abandoned. This application Jun. 26, 1978, Ser. No. 919,152
Claims priority, application United Kingdom, Feb. 4, 1971, 3928/71; Feb. 4, 1971, 3934/71
Int. Cl.[2] A61K *7/22*
U.S. Cl. 424—54 **13 Claims**

1. In a consumer product for application to or consumption by the human body comprising a consumer product base and, as additives in said base, (i) at least one of the following: a flavourant, colourant, perfuming agent, surface active agent, antiseptic or pharmaceutically active agent, and (ii) an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body in those parts of the human body with which the product comes in contact during use, the improvement which comprises using as the cold receptor stimulating ingredient an effective amount of a substantially odourless cold receptor stimulating compound of the formula:



where, when taken separately, R' is H and R" is pyridyl, or, when taken together and with the nitrogen atom to which they are attached, R' and R" jointly represent a 5–7 membered cyclic or heterocyclic group of up to 10 carbon atoms.

4,190,644

HAIR CONDITIONING COMPOUNDS

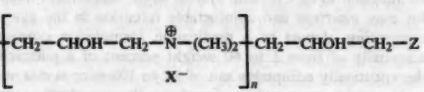
Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Kewanee Industries, Inc., Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 744,617, Nov. 24, 1976, Pat. No. 4,089,977. This application May 4, 1978, Ser. No. 902,894

Int. Cl.[2] A61K *7/06*

U.S. Cl. 424—70 **2 Claims**

1. A method of conditioning the hair which comprises applying to the hair a conditioningly effective amount of a compound or mixture of compounds having the formula:



where Z is selected from the group consisting of X and $-N(CH_3)_2$, wherein X is a halogen having an atomic weight greater than 34, where X^- is the anionic form of X, there being one such anionic halogen for each cationic nitrogen, and wherein n is an integer of from 2 to 20, said compound or mixture of compounds being formed by the reaction of equimolar proportions of 1,3-bis-dimethylamino-2-propanol and 1,3-dichloro-2-propanol, the reaction being affected at a temperature of about 40° to about 90° for about 2 to 12 hours.

4,190,645

ROTAVIRUS INNER CAPSID SUBUNIT PREPARATIONS

June D. Almeida, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 838,219, Sep. 30, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 938,230

Claims priority, application United Kingdom, Sep. 30, 1976, 40608/76

Int. Cl.[2] A61K *39/12;* **C12K** *7/00*

U.S. Cl. 424—89 **8 Claims**

1. A rotavirus inner capsid antigenic subunit preparation substantially free from complete virus particles and fragments thereof, wherein the subunits have a sedimentation coefficient of 17.5S, and a molecular weight of $>2\times10^5$ and $<2\times10^6$.

3. A method for preparing a rotavirus inner capsid subunit preparation as claimed in claim 1 or claim 2 comprising suspending a sample of faecal material obtained from a mammal infected with rotavirus, incubating the suspension at 30° to 45° C. for at least 20 minutes, removing and concentrating the subunits from the suspension by centrifugation and/or filtration.

4,190,646

POLYPEPTIDE COMPOSITIONS AND METHODS

Gideon Goldstein, Short Hills, N.J., and David H. Schlesinger, Lombard, Ill., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 851,777, Nov. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 631,175, Nov. 11, 1975, abandoned. This application Jan. 26, 1979, Ser. No. 6,893

Int. Cl.[2] A61K *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **32 Claims**

1. A polypeptide having the biological capability of inducing the differentiation of T-lymphocytes but not of complement receptor (CR+) B lymphocytes, said polypeptide having the following sequence:

R-NH-ARG-LYS-ASP-VAL-TYR-COR'

wherein R and R' are terminal groups on said polypeptide which do not substantially affect the biological capability thereof, and the pharmaceutically acceptable salts, and wherein R and R' are selected from the groups consisting of:

R	R'
Hydrogen	OH
C_1—C_7 alkyl	NH_2
C_5—C_{12} aryl	NHR_7
C_6—C_{20} alkaryl	$N(R_7)_2$
C_6—C_{20} aralkyl	OR_7
C_1—C_7 alkanoyl	VAL
C_2—C_7 alkenyl	GLN
C_2—C_7 alkynyl	LEU
GLN	TYR
GLU	VAL-GLN
GLY	VAL-LEU
GLU-GLN	
GLY-GLN	VAL-TYR
GLY-GLU	GLN-LEU
GLY-GLU-GLN	GLN-TYR
	GLN-VAL
	LEU-TYR
	LEU-LEU
	TYR-LEU
	VAL-GLN-LEU
	VAL-GLN-LEU-TYR

wherein R_7 is C_1–C_7 alkyl, C_2–C_7 alkenyl, C_2–C_7 alkynyl, C_6–C_{20} aryl, C_6–C_{20} aralkyl, or C_6–C_{20} alkaryl.

4,190,647

POLYPEPTIDES AND METHODS

Gideon Goldstein, Short Hills, N.J., and David H. Schlesinger, Lombard, Ill., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 851,778, Nov. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 631,176, Nov. 11, 1975, abandoned. This application Jan. 26, 1979, Ser. No. 6,894

Int. Cl.[2] A61K *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **32 Claims**

1. A polypeptide having the biological capability of inducing the differentiation of both T-lymphocytes and of complement receptor (CR+) B-lymphocytes, said polypeptide having the following sequence:

R-NH-X-Y-Z-GLN-LYS-COR'

X is TYR or ALA, Y is ASN is ALA, and Z is ILE or ALA, and R and R' are terminal groups on said polypeptide which do not substantially affect the biological capability thereof, and the pharmaceutically acceptable salts, wherein R and R' are selected from the groups consisting of:

R	R'
Hydrogen	OH
C_1–C_7 alkyl	NH_2
C_5–C_{12} aryl	NHR_7
C_6–C_{20} alkaryl	$N(R_7)_2$
C_6–C_{20} aralkyl	OR_7
C_1–C_7 alkanoyl	GLU
C_2–C_7 alkenyl	SER
C_2–C_7 alkynyl	THR
ASP	LEU
SER	HIS
LEU	VAL
SER-ASP	ARG
LEU-SER ASP	GLU-SER
LEU-ASP	GLU-THR
LEU-SER	

R'
GLU-SER-LEU
GLU-SER-THR
GLU-SER-THR-LEU
GLU-SER-THR-LEU-HIS
GLU-SER-THR-LEU-HIS-LEU
GLU-SER-THR-LEU-HIS-LEU-VAL
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG-LEU
GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG-LEU-ARG

wherein R_7 is C_1–C_7 alkyl, C_2–C_7 alkenyl, C_2–C_7 alkynyl, C_6–C_{20} aryl, C_6–C_{20} aralkyl, or C_6–C_{20} alkaryl.

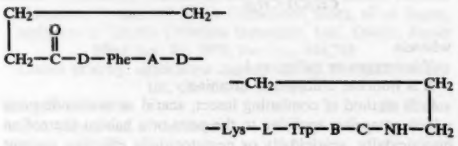
4,190,648

PEPTIDES HAVING SOMATOSTATIN ACTIVITY

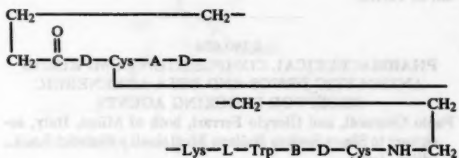
Daniel F. Veber, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 13, 1979, Ser. No. 20,148
Int. Cl.² A61K *37/100*; C07C *103/52*
U.S. Cl. 424—177 **3 Claims**

1. Compounds of the formula:



and



wherein

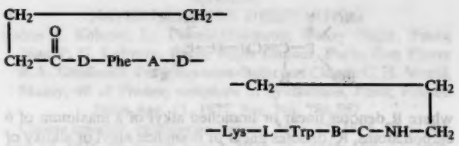
A is D—Thr, D—Val;

B is D—Phe, D—Tyr;

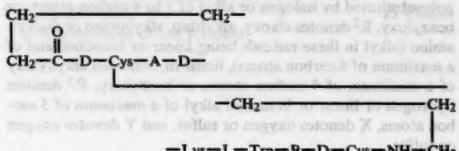
C is D—Phe, D—Tyr, O—Me—D—Tyr;

wherein the ring formed by the peptide backbone contains 26 atoms and pharmaceutically acceptable non-toxic acid addition salts thereof.

3. A composition comprising a therapeutically effective amount of the peptides having the structure:



and



wherein

A is D—Thr, D—Val,

B is D—Phe, D—Tyr,

C is D—Phe, D—Tyr, O—Me—D—Tyr

wherein the ring formed by the peptide backbone contains 26 atoms and pharmaceutically acceptable non-toxic acid addition salts thereof in a pharmaceutically acceptable excipient.

4,190,649

POLYRIBONUCLEOTIDES CAPABLE OF PROMOTING THE GENESIS OF LEUCOCYTES AND BLOOD PLATELETS

Mirko Beljanski, 46 Bd de Port Royal, Paris, France (75005)

Filed May 25, 1977, Ser. No. 800,435
Claims priority, application France, Jun. 3, 1976, 76 16875
Int. Cl.² A61K *31/70*
U.S. Cl. 424—180 **7 Claims**

1. A pharmaceutical composition in dosage unit form for treating leucocyte and platelet deficiencies, comprising from 2 to 100 mg of single-stranded chain polyribonucleotides having 20 to 80 ribonucleotide units and in which the sequence units G-A predominate, the overall ratio of purine bases to pyrimidine bases [(G+A)/(C+U)] in said polyribonucleotides being between 1.0 and 2.5 associated with a pharmaceutically acceptable vehicle.

7. A method of treating a leucocyte or platelet deficiency, comprising administering to a subject suffering from such a deficiency an effective dose of single-stranded chain polyribonucleotides having 20 to 80 ribonucleotide units and in which the sequence units G-A predominate, the overall ratio of purine bases to pyrimidine bases [(G+A)/(C+U)] in said polyribonucleotides being between 1.0 and 2.5.

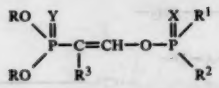
4,190,650

PHOSPHONYL VINYL PHOSPHORUS COMPOUNDS AS PESTICIDES

Karl Kiehs, Lampertheim; Hans J. Schrepfer, Ludwigshafen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,834
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715924
Int. Cl.² A01N *9/36*; C07F *9/40*
U.S. Cl. 424—204 **6 Claims**

1. A phosphoric acid derivative of the formula



I,

where R denotes linear or branched alkyl of a maximum of 6 carbon atoms, R^1 denotes linear or branched alkyl or alkoxy of a maximum of 6 carbon atoms, linear or branched alkynyloxy of a maximum of 4 carbon atoms, phenyl, phenyl mono- or polysubstituted by halogen or alkyl of 1 to 4 carbon atoms, or benzyloxy, R^2 denotes alkoxy, alkylthio, alkylamino or dialkylamino (alkyl in these radicals being linear or branched and of a maximum of 6 carbon atoms), linear or branched alkynyloxy of a maximum of 4 carbon atoms, or benzyloxy, R^3 denotes hydrogen or linear or branched alkyl of a maximum of 3 carbon atoms, X denotes oxygen or sulfur, and Y denotes oxygen or sulfur.

6. A process for combatting pests, wherein the pests or the objects to be protected against pest attack are treated with an effective amount of a phosphoric acid derivative of claim 1.

4,190,651

CYCLIC PHOSPHORIC ACID AMIDE ESTERS, AND AN INSECTICIDE CONTAINING THE SAME AS ACTIVE INGREDIENT

Morifusa Eto; Shinkichi Tawata, both of Fukuoka, and Kohei Oshima, Tama, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

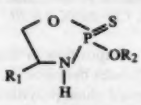
Filed Mar. 8, 1978, Ser. No. 884,527

Claims priority, application Japan, Mar. 16, 1977, 52/29103

Int. Cl.[2] C07F 9/08; A01N 9/36

U.S. Cl. 424—209 **18 Claims**

1. Compounds of the general formula:



I

wherein R_1 is one member selected from the class consisting of alkyl, alkenyl, alkynyl, aralkyl, aralkenyl and aralkynyl groups and R_2 is an alkyl group.

5. A method of preventing or inhibiting the growth of proliferation of insects which comprises applying to a site infested with or susceptible to infestation by insects an effective amount of a compound of formula I as defined in claim 1.

4,190,652

COMBATING PESTS WITH O-PHENYL-THIONOTHIOLALKANEPHOSPHONIC ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Rolf Schröder, Velbert; Bernhard Homeyer, Leverkusen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

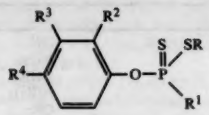
Filed Mar. 10, 1978, Ser. No. 885,234

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714771

Int. Cl.[2] A01N 9/36; C07F 9/40

U.S. Cl. 424—222 **14 Claims**

1. An O-phenyl-thionothiolalkanephosphonic acid ester of the formula



R is butyl, or alkenyl or halogenoalkyl each with up to 6 carbon atoms,

R^1 is alkyl with 1 to 6 carbon atoms,

R^2 is hydrogen, cyano, nitro, chlorine, bromine, phenyl, or alkyl, carbalkoxy, alkoxy or alkylthio each with 1 to 4 carbon atoms in the alkyl or alkoxy moiety,

R^3 is hydrogen, chlorine, methoxy or ethoxy, and

R^4 is hydrogen, chlorine, cyano, nitro, methoxy, ethoxy, methylthio, ethylthio, methylsulphonyl, ethylsulphonyl or alkyl with 1 to 4 carbon atoms.

2. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes, or to a habitat thereof, an arthropodicidally or nematicidally effective amount of a compound according to claim 1.

4,190,653

PESTICIDALLY ACTIVE O-ETHYL-S-N-PROPYL-O-2,2,2-TRIHALOETHYL-PHOSPHORO(THIONO)THIOLATES

Junichi Saito, Tokyo; Akio Kudamatsu, Kanagawa; Toyohiko Kume, and Shinichi Tsuboi, both of Tokyo, all of Japan, assignors to Nihon Takushu Noyaku Seizo K.K., Tokyo, Japan

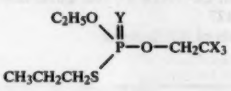
Filed Jul. 19, 1977, Ser. No. 816,980

Claims priority, application Japan, Jul. 27, 1976, 51/88639

Int. Cl.[2] A01N 9/36; C07F 9/165

U.S. Cl. 424—224 **9 Claims**

1. An O-ethyl-S-n-propyl-O-2,2,2-trihaloethylphosphoro-(thiono)thiolate of the formula



wherein

Y is oxygen or sulfur, and

X is fluorine, chlorine or bromine.

8. A method of combating insect, acarid or nematode pests which comprises applying to the pests or a habitat thereof an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent or carrier.

4,190,654

PHARMACEUTICAL COMPOSITION COMPRISING ANXIOLYTIC DRUGS AND BETA-ADRENERGIC RECEPTOR BLOCKING AGENTS

Paolo Gherardi, and Giorgio Ferrari, both of Milan, Italy, assignors to Simes Societa Italiana Medicinali e Sintatici S.p.A., Milan, Italy

Filed Aug. 21, 1978, Ser. No. 935,721

Claims priority, application Belgium, Aug. 29, 1977, 180506

Int. Cl.[2] A61K 31/33, 31/135

U.S. Cl. 424—244 **6 Claims**

1. A pharmaceutical composition in a form suitable for oral administration for the therapeutic treatment of anxiety and neurodystonic states comprising the benzodiazepine anxiolytic dimethylcarbamoyloxy-1-methyl-5-phenyl-7-chloro-1,3-dihydro-2H-1,4-benzodiazepin-2-one and the beta-adrenergic receptor blocking agent 1-(o-methoxyphenoxy)-3-isopropylamino- propan-2-ol, the ratio of the benzodiazepine

anxiolytic to beta-adrenergic receptor blocking agent being from 5 to 75 parts by weight: 10 to 100 parts by weight.

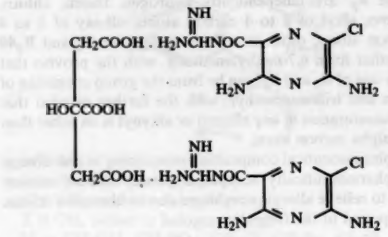
4,190,655

AMILORIDE CITRATE

Joseph DeMarco, Hatfield, and Gerald S. Brenner, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 28, 1978, Ser. No. 937,245
Int. Cl.[2] A61K *31/495;* C07D *241/16*
U.S. Cl. 424—250 4 Claims

1. A compound of the formula:



2. A pharmaceutical composition useful in the treatment of edema and hypertension which comprises a pharmaceutically acceptable amount of amiloride citrate and a pharmaceutically acceptable carrier.

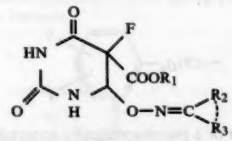
4,190,656

URACIL DERIVATIVES AND PRODUCTION THEREOF

Koichi Matsumura, Ibaraki; Osamu Miyashita, Osaka; Hiroshi Shimadzu, Settsu, and Naoto Hashimoto, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 22, 1978, Ser. No. 944,769
Claims priority, application Japan, Sep. 22, 1977, 52/114193
Int. Cl.[2] C07D *239/10*
U.S. Cl. 424—251 29 Claims

1. A compound of the formula



wherein R_1 represents a lower alkyl group; and

represents an alkylidene radical in which at least one of R_2 and R_3 is a lower alkyl group which may be substituted by phenyl, a phenyl group, a furyl group, a thienyl group, or a pyridyl group, no more than one of R_2 and R_3 being hydrogen; or

a cycloalkylidene radical of up to 6 carbon atoms, to which a benzene ring may be fused.

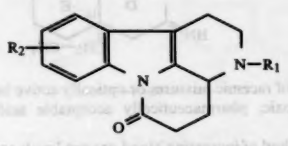
4,190,657

NAPHTHYRIDINE DERIVATIVES

Gabor I. Koletar, Le Plessis-Robinson; Henry Najer, Paris; Jean P. G. LeFevre, Paris; Régis Dupont, Paris; Don Pierre R. L. Giudicelli, Fontenay-sous-Bois, and Claude C. H. Morel, Massy, all of France, assignors to Synthelabo, Paris, France

Filed Apr. 11, 1977, Ser. No. 786,557
Claims priority, application France, Mar. 11, 1976, 77 07248; Apr. 13, 1976, 76 10773; Jun. 1, 1976, 76 16445; Oct. 27, 1976, 76 32319; Dec. 24, 1976, 76 39035; Mar. 11, 1977, 77 07249
Int. Cl.[2] A61K *31/445;* C07D *471/12*
U.S. Cl. 424—256 13 Claims

1. A compound of the formula:



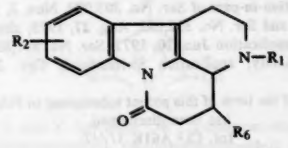
wherein

R_1 is $-(C_{1-2}alkylene)COO(C_{1-2}alkyl)$ or $-(C_{1-2}alkylene)-CO(C_{1-2}alkyl)$; or hydrogen;

R_2 is hydrogen, halogen, methyl, or methoxy;

provided that when R_1 is hydrogen, R_2 is neither hydrogen nor 10-methoxy in the form of a racemate or optical isomer thereof, or a pharmaceutically acceptable salt of said compound.

2. A compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, 3-oxobutyl, 3-hydroxybutyl, 2-oxopropyl, 2-hydroxypropyl or methoxycarbonylethyl;

R_2 is hydrogen, halogen, methyl or methoxy; and

R_6 is methoxycarbonyl, ethoxycarbonyl or cyclopropylaminocarbonyl;

in the form of a racemate or optically active form thereof, or a pharmaceutically acceptable salt of said compound.

9. A method of providing a subject with an anti-anoxia effect which comprises treating said subject with an amount of a compound of claim 1 capable of providing said anti-anoxia effect.

10. A method of providing a subject with psychotropic effect which comprises treating said subject with an amount of a compound of claim 1 capable of providing said psychotropic effect.

11. A method of providing a subject with an anti-anoxia effect which comprises treating said subject with an amount of a compound of claim 2 capable of providing said anti-anoxia effect.

4,190,658

14-IMINO-(15H)-EBURNAMINE COMPOUNDS, COMPOSITIONS, METHODS OF USE AND PROCESS OF SYNTHESIS

Julien Warnant, Neuilly-sur-Seine; André Farcilli, Rosny-sous-Bois, and Italo Medici, Bondy, all of France, assignors to Roussel Uclaf, Paris, France

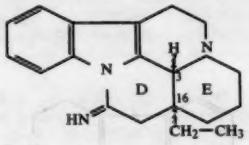
Filed Jul. 17, 1978, Ser. No. 925,103

Claims priority, application France, Jul. 25, 1977, 77 22747

Int. Cl.[2] A61K *31/475*; C07D *471/22*

U.S. Cl. 424—256 **13 Claims**

1. A compound selected from the group consisting of a compound of the formula



in the form of racemic mixtures or optically active isomers and their non-toxic, pharmaceutically acceptable acid addition salts.

11. A method of increasing blood oxygen levels and cerebral blood flow in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim 1 sufficient to increase blood oxygen content and cerebral blood flow.

4,190,659

PHARMACEUTICAL PREPARATION AND USE OF 4-HYDROXY-2-QUINOLINONE-3-CARBOXYLIC ACID ESTERS

Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 662,148, Feb. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 557,984, Mar. 12, 1975, abandoned, which is a division of Ser. No. 454,070, Mar. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 303,099, Nov. 2, 1972, abandoned, and Ser. No. 392,082, Aug. 27, 1973, abandoned. This application Jun. 20, 1977, Ser. No. 807,898

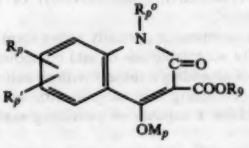
Claims priority, application Switzerland, Oct. 23, 1973, 14933/73

The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.

Int. Cl.[2] A61K *31/47*

U.S. Cl. 424—258 **69 Claims**

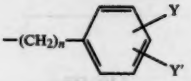
1. The method of treating allergic conditions due to histamine release comprising administering to a mammal in need of such treatment an allergy treating effective amount of a compound of the formula:



wherein

R_9 is alkyl of 1 to 4 carbon atoms,

R_p^o is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 to 2 carbon atoms, or



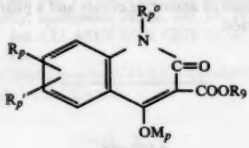
M_p is hydrogen or a pharmaceutically acceptable cation,

n is 0 or 1,

Y and Y' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro, with the proviso that only one of Y and Y' can be from the group consisting of nitro and trifluoromethyl, and

R_p and R_p' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro or trifluoromethyl, or R_p and R_p' together form 6,7-methylenedioxy, with the proviso that only one of R_p and R_p' can be from the group consisting of nitro and trifluoromethyl, with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom.

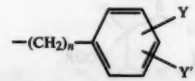
33. A pharmaceutical composition comprising in unit dosage form a pharmaceutically acceptable carrier and an amount effective to relieve allergic conditions due to histamine release of a compound of the formula:



wherein

R_9 is alkyl of 1 to 4 carbon atoms,

R_p^o is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 or 2 carbon atoms, or



M_p is hydrogen or a pharmaceutically acceptable cation,

n is 0 or 1,

Y and Y' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro, with the proviso that only one of Y and Y' can be from the group consisting of nitro and trifluoromethyl, and

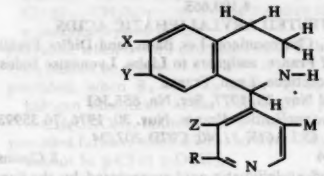
R_p and R_p' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro or trifluoromethyl, or R_p and R_p' together form 6,7-methylenedioxy, with the proviso that only one of R_p and R_p' can be from the group consisting of nitro and trifluoromethyl, with the further proviso that the unsaturation in any alkenyl or alkynyl is on other than the alpha carbon atom.

4,190,660
ANTI-DRUG WITHDRAWAL SYNDROME COMPOSITION AND METHOD OF USE

Patrick M. Siu, 103 Sheffield St., Silver Spring, Md. 20910

Filed Aug. 11, 1978, Ser. No. 932,940
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 4 Claims

1. A pharmaceutical composition in dosage unit for alleviating the withdrawal syndrome created in an individual undergoing drug withdrawal comprising a dosage unit in the form of a powder, tablet, capsule or sterile isotonic solution for injection containing an effective but non-toxic quantity in a pharmaceutically acceptable carrier of a compound having the following general formula:



ps wherein:

X is H, OH, or halogen group;

Y is OH, amino or halogen group;

Z is OH, amino or halogen group;

M is CH_2OH, CH_2PO_4, CH_2Cl, CH_2Br, Ch_2Fl, or CH_2I group,

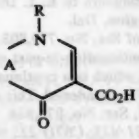
R is H_2 or an alkyl group having 1 to 5 carbon atoms.

4,190,661
PYRAZOLO-QUINOLINES, COMPOSITIONS AND PHARMACEUTICAL PREPARATIONS

P. Le Hao Dong, Montpellier, and Claude Coquelet, St. Gely du Fesc, both of France, assignors to Laboratoires Chauvin-Blache, Montpellier, France

Filed May 16, 1978, Ser. No. 906,410
Claims priority, application France, May 20, 1977, 77 15573
Int. Cl.[2] A61K *31/47*; C07D *471/04*
U.S. Cl. 424—258 6 Claims

1. A compound selected from the group consisting of compounds of the formula



(I)

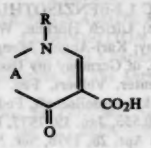
in which:

R is selected from C_{1-6} alkyl and C_{1-6} alkenyl,

A is selected from indazol-4,5-diyl, indazol-6,7-diyl, and the same groups substituted on the nitrogen atoms at 1- or 2-position with a substituent selected from C_{1-6} alkyl and phenyl-(C_{1-6})alkyl

and a salt thereof with a pharmaceutically acceptable base.

5. Therapeutic composition having an antibacterial activity, comprising an antibacterial effective amount of a compound selected from the group consisting of compounds of the formula



(I)

in which:

R is selected from C_{1-6} alkyl and C_{1-6} alkenyl,

A is selected from indazol-4,5-diyl, indazol-6,7-diyl, and the same groups substituted on the nitrogen atoms at 1- or 2-position with a substituent selected from C_{1-6} alkyl and phenyl-(C_{1-6})alkyl,

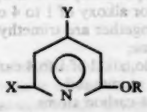
and a salt thereof with a pharmaceutically acceptable base.

4,190,662
HALOMETHYL SUBSTITUTED DIALKOXYPYRIDINES

Myk R. Fenstermacher, Baton Rouge, La., and Robert L. Noveroske, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

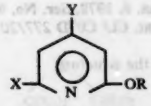
Filed Mar. 23, 1978, Ser. No. 889,179
Int. Cl.[2] A01N *9/22*; C07D *213/61, 213/64*
U.S. Cl. 424—263 38 Claims

1. A substantially pure compound corresponding to the formula



wherein X and Y represent OR', trichloromethyl, trifluoromethyl, dichloromethyl, dichlorofluoromethyl or chlorodifluoromethyl with the proviso that one of X or Y must be OR' and the other of X and Y is other than OR'; and R and R' each independently represent alkyl of 1 to 12 carbon atoms or alkenyl of 3 or 4 carbon atoms.

12. A fungicidal composition comprising a fungicidally-effective amount of a compound corresponding to the formula



wherein X and Y represent OR', trichloromethyl, trifluoromethyl, dichloromethyl, dichlorofluoromethyl or chlorodifluoromethyl with the proviso that one of X or Y must be OR' and the other of X and Y is other than OR'; and R and R' each independently represent alkyl of 1 to 12 carbon atoms or alkenyl of 3 or 4 carbon atoms, in intimate admixture with an inert adjuvant therefor.

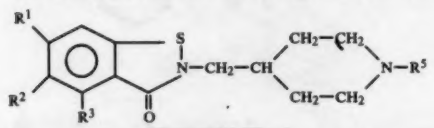
4,190,663

ANTI-THROMBOTIC 1,2-BENZISOTHIAZOLIN-3-ONES

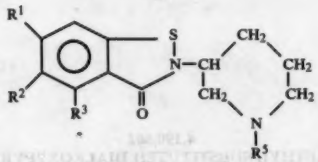
Horst Böshagen, Haan; Ulrich Hörlein, Wuppertal, both of Fed. Rep. of Germany; Karl-August Meng, deceased, late of Wuppertal, Fed. Rep. of Germany (by Ilse H. F. Meng, heiress), and Friedel Seuter, Velbert, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 760,555, Jan. 19, 1977, Pat. No. 4,156,729.
This application Apr. 28, 1978, Ser. No. 901,191
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602643
Int. Cl.[2] A61K *31/445;* C07D *417/06, 417/04*
U.S. Cl. 424—267 15 Claims

1. A compound selected from the group consisting of 6-substituted 7-unsubstituted 1,2-benzisothiazolin-3-ones depicted by the formula:



or



and the pharmaceutically acceptable acid addition salts thereof wherein

R^1 when taken independently of R^2 is chloro, bromo, fluoro, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or an aromatic substituent selected from the group consisting of phenoxy, benzyloxy and phenylthio which aromatic substituent is unsubstituted or substituted with alkyl of 1 to 4 carbon atoms or halo;

R^2 when taken independently of R^1 is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R^1 and R^2 taken together are trimethylene, tetramethylene or pentamethylene;

R^3 is hydrogen, halo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; and

R^5 is alkyl of 1 to 4 carbon atoms.

15. The method of achieving an antithrombotic effect in a human or other warm blooded animal in need thereof which comprises administering thereto an antithrombotically effective amount of a compound according to claim 1.

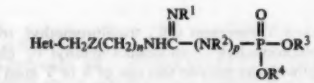
4,190,664

AMIDINO AND GUANIDINO PHOSPHONATES

Graham J. Durant, Welwyn Garden City; Rodney C. Young, Bengeo, both of England, and Zeav Tashma, Jerusalem, Israel, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

Filed Jun. 6, 1978, Ser. No. 913,180
Int. Cl.[2] C07D *277/20*
U.S. Cl. 424—270 17 Claims

1. A compound of the structure



in which

Het is a 5- or 6-membered fully unsaturated heterocycle containing at least one nitrogen atom, said heterocycle being imidazole, thiazole, isothiazole, oxazole, isoxazole or thiadiazole, and optionally substituted by lower alkyl, trifluoromethyl, hydroxymethyl, halogen, hydroxy or lower alkoxy;

Z is sulphur or methylene;

n is 2 or 3;

R^1 is hydrogen, lower alkyl or Het—$CH_2Z(CH_2)_n$—;

p is 0 or 1;

R^2 is hydrogen or lower alkyl;

or R^1 and R^2 together form a $(CH_2)_2$ or $(CH_2)_3$ group;

R^3 is lower alkyl, phenyl or phenyl(lower alkyl), and

R^4 is hydrogen when p is 0 and hydrogen, lower alkyl, phenyl or phenyl(lower alkyl) when p is 1.

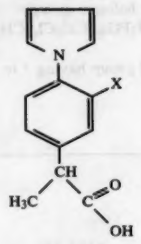
4,190,665

SUBSTITUTED ARYLALIPHATIC ACIDS

Etienne Szarvasi, Charbonnieres-Les Bains, and Didier Festal, Ecully, both of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

Filed Nov. 28, 1977, Ser. No. 855,361
Claims priority, application France, Nov. 30, 1976, 76 35993
Int. Cl.[2] A61K *31/40;* C07D *207/24*
U.S. Cl. 424—274 8 Claims

1. A substituted arylaliphatic acid represented by the formula



in which X is a nitro or amino group.

6. A method of treating patients with pain or inflammation comprising orally administering to the patient an analgesic or anti-inflammatory amount of the arylaliphatic acid of claim 1.

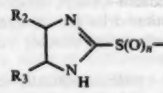
4,190,666

ANTI-INFLAMMATORY 4,5-DIARLY-2-(SUBSTITUTED-THIO)IMIDAZOLES AND THEIR CORRESPONDING SULFOXIDES AND SULFONES

Saul C. Cherkofsky, Wilmington, Del., and Thomas R. Sharpe, Fort Salonga, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 779,805, Mar. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,282, Jun. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 603,650, Aug. 11, 1975, abandoned. This application Feb. 10, 1978, Ser. No. 876,864
Int. Cl.[2] A61K *31/415;* C07D *233/84, 233/86*
U.S. Cl. 424—274 82 Claims

1. A compound of the formula



where

n=0, 1, or 2;

R_1=C_1—C_8 alkyl; allyl; vinyl; —CH_2COCH_3; —CH_2-

$S(O)_m$ CH_3, where m=0, 1, or 2; mono— or polyhalo— C_1–C_8 alkyl;

R_2 and R_3, the same or different=

Y_1 and Y_2, the same or different=hydrogen, C_1–C_4 alkoxy, acetoxy, C_1–C_4 alkyl, Cl, F, CF_3, $N(CH_3)_2$, NO_2, CH_3S—, CH_3SO_2—, or Y_1 and Y_2 taken together forming a dioxymethylene bridge;

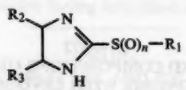
provided, when n=0, 1 or 2 and Y_1 and Y_2 both=hydrogen, R_1 cannot be vinyl;

provided, when R_1=C_1–C_8 alkyl, C_3–C_8 haloalkyl with halogen substituted at the 3 through 8 position, allyl or —CH_2COCH_3, both Y_1 and Y_2 cannot be H;

provided further, when n=O and R_1=CH_3, both Y_1 and Y_2 cannot be p-Cl or p-OCH_3;

its pharmaceutically suitable acid addition salt where N=O or its pharmaceutically suitable metal salt where n=1 or 2.

56. A method of treating arthritis in a mammal which comprises administering to the mammal an effective anti-arthritic amount of a compound of the formula

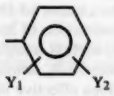


where

n=0, 1, or 2;

R_1=C_1–C_8 alkyl; allyl; vinyl; —CH_2COCH_3; —$CH_2S(O)_m$ CH_3, where m=0, 1, or 2; mono- or polyhalo- C_1–C_8 alkyl;

R_2 and R_3, the same or different =



Y_1 and Y_2, the same or different=hydrogen, C_1–C_4 alkoxy, acetoxy, C_1–C_4 alkyl, Cl, F, CF_3, —$N(CH_3)_2$, NO_2, CH_3S—, CH_3SO_2—, or Y_1 and Y_2 taken together forming a dioxymethylene bridge;

provided, when R_1=C_1–C_8 alkyl, C_3–C_4 haloalkyl with the halogen substituted at the 3 through 8 position, allyl, or —CH_2COCH_3 both Y_1 and Y_2 cannot be H;

its pharmaceutically suitable acid addition salt where n=0 or its pharmaceutically suitable metal salt where n=1 or 2.

4,190,667

Patent Not Issued For This Number

4,190,668

STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City, and Charles A. Wilson, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

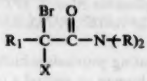
Filed Dec. 14, 1977, Ser. No. 860,497

Int. Cl.[2] A01N 9/20

U.S. Cl. 424—304 **19 Claims**

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial compound of the formula:

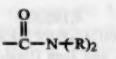


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R_1 is a cyano radical or an amido radical of the formula:

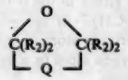


wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being a normally liquid polyalkylene glycol of the ethylene, trimethylene or tetramethylene series or a mono- or di-saturated hydrocarbyl ether thereof;

(c) water; and

(d) a stabilizing amount of a 5- or 6-membered saturated cyclic ether or an inertly substituted 5- or 6-membered saturated cyclic ether, said stabilizing amount being an amount sufficient to measurably reduce the decomposition of the halogenated amide antimicrobial in the aqueous composition and said cyclic ether corresponding to the formula:



wherein Q represents divalent organic radical of the formula —$C(R_2)_2$—$C(R_2)_2$—, —$C(R_2)_2$—O—, —$C(R_2)_2$—$C(R_2)_2$—$C(R_2)_2$—, —$C(R_2)_2$—O—$C(R_2)_2$—, —$C(R_2)_2$—$C(R_2)_2$—O—, —O—$C(R_2)_2$—O—, or —$C(R_2$-

$)_2—N(R_2)—C(R_2)_2$—and wherein each R_2 is individually hydrogen or a monovalent saturated hydrocarbon radical containing from 1 to about 8 carbon atoms.

4,190,669

METHOD FOR TREATING PSORIASIS

John J. Voorhees, Ann Arbor, Mich.; Sven R. Hammarström, Djursholm, Sweden; Mats A. Hamberg, Lidingö, Sweden, and Bengt I. Samuelsson, Danderyd, Sweden, assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 664,652, Mar. 8, 1976, abandoned. This application May 2, 1977, Ser. No. 793,099

Int. Cl.² A61K *31/215, 31/185*

U.S. Cl. 424—305 **11 Claims**

1. A method for treating psoriasis which comprises administering to the afflicted human or animal a composition containing as its active component at least one compound having the formula

$$CH_3(CH_2)_4—(C{\equiv}C—CH_2)a_1—(CH_2)b_1CO_2H$$

wherein a_1 stands for an integer of from 3 to 5 and b_1 stands for an integer of form 0 to 8, and the alkyl esters of such compounds, said compound being in association with a pharmaceutical carrier, wherein said active component is present in an amount which is effective to alleviate psoriasis in the range of about 0.1% to about 15% w/v.

4,190,670

PROSTAGLANDIN DERIVATIVES

Arthur F. Marx, Delft, and Jean Doodewaard, Schipluiden, both of Netherlands, assignors to Gist Brocades N.V., Netherlands

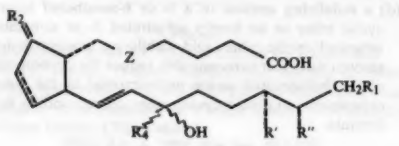
Division of Ser. No. 561,895, Mar. 25, 1975, Pat. No. 4,054,595. This application Sep. 9, 1977, Ser. No. 831,949

Claims priority, application United Kingdom, Mar. 26, 1974, 13399/74; Mar. 26, 1974, 13400/74

Int. Cl.² C07C *177/00*

U.S. Cl. 424—305 **24 Claims**

1. The 18ξ- and 19ξ-hydroxy-prostaglandin compounds of the formula



wherein the waved lines indicate that the substituents at the represented bonds are either in the α or β position,

Z represents $—CH_2CH_2—$ or cis —CH=CH—,

R_1 represents a hydrogen atom or methyl or ethyl group,

R_2 represents an oxygen atom or a hydrogen atom and an α or β hydroxyl group,

R_4 represents a hydrogen or a methyl group and

one of R' and R'' represents a hydroxyl group and the other a hydrogen atom, with the proviso that Z cannot be —CH=CH— when R_2 is oxygen, and

the pharmaceutically acceptable salts or the aliphatic esters thereof.

4,190,671

CHALCONE DERIVATIVES

Anthony E. Vanstone, Whitton, and Graham K. Maile, Harlow, both of England, assignors to Biorex Laboratories Limited, London, England

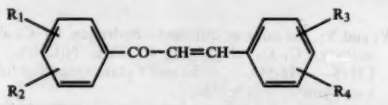
Filed Mar. 3, 1978, Ser. No. 883,252

Claims priority, application United Kingdom, Mar. 17, 1977, 11339/77; Aug. 26, 1977, 35925/77

Int. Cl.² C07C *65/22;* A61K *31/19;* C07C *65/20*

U.S. Cl. 424—317 **13 Claims**

1. A compound of the general formula:



wherein R_1 is a carboxyalkoxy radical, R_2 and R_3, which may be the same or different, are hydrogen or halogen atoms, hydroxyl groups or alkoxy radicals and R_4 is carboxylalkoxy or a carboxyalkylcarbonyloxyalkyl radical or a carboxylic acid group; and the non-toxic inorganic and organic salts thereof.

13. A pharmaceutical composition for treating inflammatory and allergic conditions and for treating ulcerous conditions of the gastro-intestinal tract in humans which comprises an effective amount of a compound of claim 1 in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,190,672

METHOD AND COMPOSITIONS OF TREATING PARKINSONISMS WITH LEVODOPA AND 3',4'-DIHYDROXY-2-METHYLISOPROPIOPHENONE

Stanley Fahn, 155 Edgars La., Hastings-on-Hudson, N.Y. 10706

Filed Sep. 1, 1978, Ser. No. 939,036

Int. Cl.² A61K *31/12, 31/195*

U.S. Cl. 424—319 **8 Claims**

1. A method of treating a central nervous system dopamine deficiency disease (CNS-DADD) in a human suffering from said CNS-DADD which comprises:

(1) systemically administering to said human an amount on the order of 6–10 grams per day intravenously, or an equivalent dosage by routes other than intravenous administration, of 3',4'-dihydroxy-2-methyl-isopropiophenone (DHMPP), an amount of DHMPP effective to inhibit in vivo the conversion of levodopa to 3-O-methyldopa by catechol-O-methyl transferase (COMT); and

(2) concomitantly systemically administering to said human an amount of levodopa effective to control the symptoms of said CNS-DADD.

4,190,673

COLCHICINE OPHTHALMIC COMPOSITION AND METHOD OF USE

Kenneth E. Eakins, Sparkill, and Parimal Bhattacherjee, Nyack, both of N.Y., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed May 10, 1978, Ser. No. 904,586

Int. Cl.² A61K *31/165*

U.S. Cl. 424—324 **8 Claims**

1. A method for reducing intraocular pressure in humans and animals comprising topically administering to the eye of a human or animal having increased intraocular pressure an effective, intraocular pressure reducing amount of Colchicine together with a suitable ophthalmic pharmaceutical carrier.

4,190,674

3-FLUORO-N-CYCLOPROPYLCINNAMIDE

Eugene M. Grivsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 712,134, Aug. 6, 1976, abandoned, and a continuation-in-part of Ser. No. 820,300, Jul. 29, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,275

Claims priority, application United Kingdom, Jan. 27, 1977, 4168/77

Int. Cl.[2] C07C *103/76;* A61K *31/165*

U.S. Cl. 424—324 19 Claims

1. Trans 3-fluoro-N-cyclopropylcinnamamide.

11. A method for the treatment or prophylaxis of increased muscle tone of a mammal which comprises administration to said mammal of a non-toxic effective tone decreasing amount of trans-3-fluoro-N-cyclopropylcinnamamide.

4,190,675

METHOD FOR THE PREPARATION OF VERBENONE, MYRTENAL AND PINOCARVEOL AND THEIR THERAPEUTICAL USE

Davide Vegezzi, Massagno, Switzerland, assignor to Enrico Corvi Mora, Piacenza, Italy

Division of Ser. No. 801,260, May 27, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,424

Claims priority, application Switzerland, Jun. 3, 1976, 7042/76

Int. Cl.[2] A61K *31/12*

U.S. Cl. 424—331 1 Claim

1. The process of treating inflammation of the bronchia comprising administering from 10 to 100 milligrams/day of verbenone to a patient having inflammation of the bronchia.

4,190,676

COMPOSITE FRUIT GEL AND ICE CONFECTION

Hans Göringer, Norderstedt, Fed. Rep. of Germany; Thomas R. Kelly, Wellingborough, England; Dieter Ries, and Hermann Silberzahn, both of Hamburg, Fed. Rep. of Germany, assignors to Thomas J. Lipton, Englewood Cliffs, N.J.

Filed Mar. 17, 1978, Ser. No. 887,937

Claims priority, application United Kingdom, Mar. 17, 1977, 11469/77

Int. Cl.[2] A23G *9/04*

U.S. Cl. 426—100 4 Claims

1. A process for preparing a composite food product, which comprises:

(a) dosing an incipiently gelling material selected from the group consisting of calcium alginate and calcium low-methoxy pectate into a mold, and

(b) dosing a portion of an ice confection onto the incipiently gelling dosed material, thereby forming a depression in the incipiently gelling dosed material in which the ice confection can sit.

4,190,677

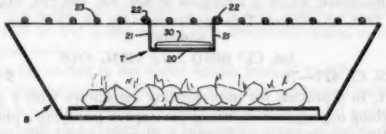
METHOD FOR PRODUCING WOOD SMOKE ON A CHARCOAL GRILLE

John S. Robins, 1250 S. Monaco, Denver, Colo. 80222

Filed Sep. 8, 1975, Ser. No. 611,142

Int. Cl.[2] A23L *1/01;* A23B *4/04*

U.S. Cl. 426—315 1 Claim



1. A method for generating wood smoke in a broiler wherein fuel is ignited to flame and burn and meat is placed for cooking, to impart smoke flavor to meat cooked therein, including the steps of:

(a) placing the meat within the broiler to provide surfaces of the meat which are separated from the flames of the burning fuel;

(b) placing upon such surfaces a bed of wood flour which is ground and milled to a fineness of at least 40 mesh; and

(c) igniting the wood flour bed to permit the same to smoulder and emit smoke to permeate the meat as it is being cooked.

4,190,678

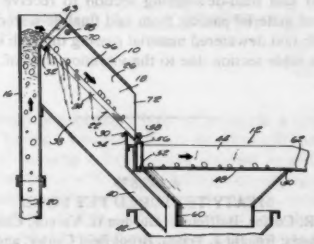
METHOD AND APPARATUS FOR DEWATERING VEGETABLES AND THE LIKE

Edwin F. Pleus, Sun Prairie, Wis., assignor to Aunt Nellie's Foods, Inc., Clyman, Wis.

Continuation of Ser. No. 683,028, May 4, 1976, abandoned. This application Aug. 18, 1978, Ser. No. 934,893

Int. Cl.[2] A23N *1/00;* B07B *1/30*

U.S. Cl. 426—478 9 Claims



1. A method of dewatering and inspecting a water-vegetable mixture comprising the steps of:

(a) forcing a water-vegetable mixture into the bottom portion of a vertical compartment having an open top to cause the mixture to flow upwardly in the compartment and out over a top edge of the compartment;

(b) removing a substantial portion of the water in the mixture by causing the mixture to flow downwardly from the open top of the vertical compartment over a screen member, said screen member positioned at an angle to the horizontal;

(c) removing a final portion of the water from the mixture by depositing the mixture on a vibrating screen member; and

(d) inspecting the dewatered vegetables by passing the dewatered vegetables over a vibrating inspection table.

4. A combination dewatering and inspection apparatus comprising:

a frame structure;

a pre-dewatering unit fixedly mounted on said frame structure, said pre-dewatering unit including a vertically extending receiving compartment having an inlet in the lower portion thereof and an open top having a top edge, said receiving compartment adapted to receive a mixture of liquid and solid material at the inlet thereof for flow upwardly therethrough to the open top thereof and then out of the open top over said top edge of the compartment, said pre-dewatering unit further including a pre-dewatering chute located adjacent said top edge of said open top of said receiving chamber and adapted to receive the mixture flowing from the open top of said receiving chamber, said pre-dewatering chute including an upper chamber and a lower chamber separated by a screen member mounted in said pre-dewatering chute, said screen member being inclined downwardly from its receiving end and positioned so that the solid material in the mixture will pass over the top surface of the screen member and a

substantial portion of the liquid material will pass through said screen member into said lower chamber; and

a final-dewatering and inspection table unit mounted adjacent said pre-dewatering unit, said final-dewatering and inspection table unit including a final-dewatering section movably mounted on said frame structure and a horizontal impervious inspection table section movably mounted on said frame structure, said final-dewatering and inspection table unit further including a vibratory means mounted on said frame structure for imparting a vibratory movement to said final-dewatering and inspection table sections, said final-dewatering section including a horizontal screen member mounted therein and positioned adjacent the lower end of said inclined screen member mounted in said pre-dewatering chute to receive the mixture flowing from said pre-dewatering chute of said pre-dewatering unit with the solid material in the mixture passing over the top surface of said horizontal screen member due to the vibration thereof and with a final portion of the water in the mixture passing through said horizontal screen member, said impervious inspection table section positioned adjacent said final-dewatering section to receive the dewatered material passing from said final de-watering section with said dewatered material passing through said inspection table section due to the vibration thereof.

4,190,679

MEATY TEXTURED PET FOOD

Harold R. Coffee, Baltimore; Gordon G. Varcoe, Cobourg, both of Canada; Ronald J. Triani, Brookfield Center, and George S. Hayden, New Fairfield, both of Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 26, 1977, Ser. No. 791,099
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—623 **1 Claim**

1. A pet food comprised of resilient, textured, meat-like chunks having an expanded structure internally and an external substantially-continuous, fibrous, highly-irregular skin, having a moisture content in the range of from greater than 16% up to 20%, an A_w of from 0.50 to 0.75, a resilience within the range of from 30% to 50%, a bulk density of from 18 to 25 lb/ft^3, and from above 25 to about 60% farinaceous material and from 2 to 15% of a polyhydric alcohol in combination with a dry crunchy portion having an A_w substantially the same as the meatlike chunks and a firmness of at least 1400 lb/in^3.

4,190,680

ADHERENT CONTROLLED RELEASE PESTICIDES

Robert W. Young, New York, N.Y.; Samuel Prussin, Carmel, Calif., and Norman G. Gaylord, New Providence, N.J., assignors to Young, Prussin, Mgk, J. V., New York, N.Y.

Continuation of Ser. No. 868,685, Jan. 11, 1978, abandoned, which is a continuation of Ser. No. 696,360, Jun. 15, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,515
Int. Cl.[2] A61K *31/00*
U.S. Cl. 427—4 **11 Claims**

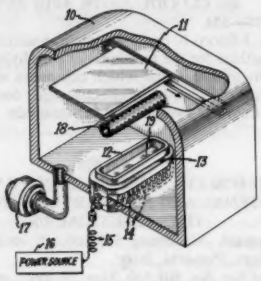
1. A composition consisting essentially of (a) a hydrolyzable titanium compound or a partial hydrolyzate thereof, said titanium compound being selected from the group consisting of tetraesters, tetraanhydrides, tetraamides and chelates of glycols, hydroxy acids, dicarboxylic acids, diketones, ketoesters and alkanolamines, and (b) an insecticide, said composition being capable of forming a polymeric coating.

4,190,681

METHOD OF COATING A POLYCARBONATE SUBSTRATE WITH GLASS

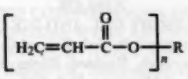
Walter L. Hall, Mt. Vernon, Ind., and James S. Humphrey, Jr., Clemmons, N.C., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 13, 1978, Ser. No. 959,883
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—45.1 **15 Claims**



1. A method of producing a shaped non-opaque polycarbonate article having improved mar, abrasion, scratch and organic solvent resistance comprising the steps of:

(i) applying onto a polycarbonate substrate in ultraviolet light curable primer composition containing at least one polyfunctional acrylic monomer represented by the general formula



wherein n is an integer having a value of from 2 to 4, and R is an n valent hydrocarbon radical, n valent substituted hydrocarbon radical, n valent hydrocarbon radical containing at least one ether linkage, or an n valent substituted hydrocarbon radical containing at least one ether linkage, and a photoinitiator;

(ii) exposing said polycarbonate substrate containing said primer composition to ultraviolet light for a period of time sufficient to effectuate a cure of said primer composition, thereof producing a cured primer layer on said polycarbonate substrate; and

(iii) vapor depositing, under vacuum conditions, and using radio frequency induction heating means, a thin layer containing SiO_2 onto said primed polycarbonate substrate.

4,190,682

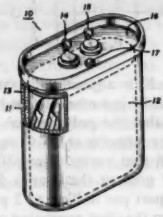
PROCESS FOR IMPREGNATING A CAPACITOR WITH A NON-HALOGENATED IMPREGNANT

David G. Shaw, Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 784,144, Apr. 4, 1977, abandoned, which is a division of Ser. No. 669,755, Mar. 24, 1976, abandoned. This application Oct. 10, 1978, Ser. No. 949,409
Int. Cl.[2] B05D *5/12*; H01G *4/04*
U.S. Cl. 427—79 **5 Claims**

1. In a process for impregnating capacitors with a gas absorbing impregnant including the steps of purifying a phthalate ester impregnant by adsorptive filtering said impregnant to remove impurities and impregnating the capacitor with the purified impregnant, the improvement comprising the addi-

tional step of adding 5 to 30% by volume of an alkene having from 10 to less than about 20 carbon atoms and 0.1 to 10% by



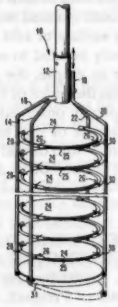
volume of an epoxide stabilizer to said purified phthalate ester impregnant prior to impregnating the capacitor.

4,190,683

METHOD FOR FORMING A LIQUID PHASE EPITAXIAL FILM ON A WAFER

John E. Davies, San Francisco, and Guido Galli, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,243
Int. Cl.² H01F *10/02*
U.S. Cl. 427—130 **4 Claims**



1. A method of forming an improved liquid phase epitaxial film on a plurality of wafers comprising the steps of:

positioning a plurality of wafers in a wafer holding means whereby the wafers are arranged in a stacked manner and where the spacing between the wafers is substantially the same;

inserting the wafer holding means into a liquid melt whereby the wafers are completely immersed in the liquid melt;

growing a film on the wafers while said wafers are positioned in the wafer holder in a horizontal plane in the liquid melt;

tilting the wafers in the wafer holder from 5° to 90°;

removing the wafer holder from said melt while said wafers are in a tilted position to drain the melt from said wafers;

positioning said wafers in a horizontal plane in the wafer holder; and

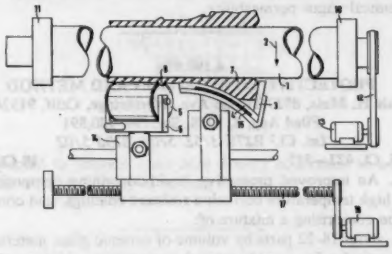
rotating the wafer holder to remove the remaining melt droplets from the edges of said wafers.

4,190,684

METHOD AND APPARATUS FOR APPLYING A RUBBER LAYER TO A CYLINDRICAL WORKPIECE

John H. Barwell, 13 Cranmer Rd., Cambridge, and Aleksander Wielesiuk, 27 Whitton Close, Swavesey, Cambridgeshire, both of England

Filed Jul. 28, 1978, Ser. No. 928,780
Claims priority, application United Kingdom, Aug. 3, 1977, 32621/77
Int. Cl.² B05D *3/02, 3/12*
U.S. Cl. 427—194 **17 Claims**



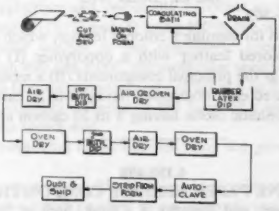
1. A method of applying a layer of rubber to a cylindrical workpiece having a longitudinal axis therethrough comprising the steps of: locating a feed surface adjacent to and spaced from the workpiece with the feed surface converging towards the workpiece to form a nip with the workpiece, rotating the workpiece about its axis, delivering rubber into the nip between the workpiece and feed surface, and moving the feed surface along the length of the workpiece in a direction parallel to the axis of the workpiece, thereby compressing and rendering the rubber in the nip between the feed surface and workpiece plastic to form a layer of rubber around the workpiece having a generally uniform thickness determined by the size of the nip.

4,190,685

CHEMICAL RESISTANT ARTICLE

John A. Hart, Kanata, and John C. Collyer, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Feb. 27, 1978, Ser. No. 881,533
Claims priority, application Canada, Dec. 8, 1977, 292702
Int. Cl.² B05D *1/38, 1/20;* A41D *19/00*
U.S. Cl. 427—302 **14 Claims**



1. A method for producing an article of clothing which is resistant to toxic chemicals in liquid and vapor form, comprising the steps of:

a. providing a former for said article of clothing;

b. coating said former with a latex coagulating agent;

c. dipping the coated former into a latex dispersion of resilient elastomer selected from the group consisting of natu-

ral rubber, polyacrylate, polybutadiene, styrene-butadiene copolymer, acrylonitrile-butadiene and polychloroprene and drying to produce an elastomer coated former;

d. coating said elastomer coated former with a solution of a butyl rubber in a suitable volatile organic solvent;

e. drying the butyl rubber coating so formed; and

f. simultaneously curing said elastomer coating and said butyl rubber coating in situ at elevated temperature;

wherein said rubber coating exhibits a high affinity for a toxic chemical vapor and is impermeable to said toxic chemical vapor, and wherein said butyl rubber coating is substantially impermeable to a liquid toxic chemical and exhibits low toxic chemical vapor permeability.

4,190,686

PROTECTIVE COMPOSITION AND METHOD

Louis H. Muis, 8527 Tampa Ave., Northridge, Calif. 91324

Filed Aug. 4, 1978, Ser. No. 930,891

Int. Cl.[2] B27K *3/52, 5/04;* **B29J** *5/02*

U.S. Cl. 427—317 **18 Claims**

1. An improved protective liquid-containing composition, for high temperature corrosion resistant coatings, said composition comprising a mixture of:

a. about 18–22 parts by volume of ceramic glaze material in powder form, said material comprising a mixture of the oxides of silicon, aluminum, sodium and calcium, together with the oxides of at least one of magnesium, iron, titanium, potassium, lead and boron;

b. about 90–110 parts by volume of adhesive comprising thermosetting phenolic resin in a solvent;

c. about 9–11 parts by volume of high temperature paint powder comprising thermosetting resin selected from the group consisting of polyester resin, epoxy resin, acrylic resin and a mixture of epoxy resin and polyester resin, and a coloring agent; and,

d. about 10.8–13.2 parts by volume of leveling agent comprising at least one of organo-modified clay and thermosetting silicone-containing resin.

4,190,687

METHOD FOR TREATING LEATHER

Takahisa Sugiura, Takatsuki; Sadaharu Abeta, Toyonaka; Takashi Kato, Amagasaki, and Hiroshi Hotta, Muko, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 690,181, May 26, 1976, abandoned, which is a continuation of Ser. No. 357,658, May 7, 1973, abandoned. This application Oct. 20, 1977, Ser. No. 844,126

Claims priority, application Japan, May 9, 1972, 47-46041; Oct. 4, 1972, 47-100115; Oct. 5, 1972, 47-100207

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—389 **36 Claims**

1. A method for treating a colored leather, which comprises treating a colored leather with a copolymer (I) consisting essentially of as the principal components (B) a monoethylenically unsaturated ester compound having 4 to 22 carbon atoms and (A) an aliphatic olefin having 3 to 20 carbon atoms.

4,190,688

SILICONE PAPER RELEASE COMPOSITIONS

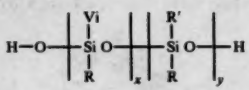
Frank J. Traver, and Timothy J. Cietek, both of Troy, N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,985

Int. Cl.[2] B05D *3/02;* **C08L** *43/04, 91/00*

U.S. Cl. 427—391 **28 Claims**

28. A process for coating paper with a silicone paper release coating with excellent release properties to pressure sensitive adhesives comprising (1) emulsifying a mixture of (A) 100 parts by weight of a vinyl-containing polymer of the formula,



where Vi is vinyl, R is aliphatically saturated monovalent hydrocarbon radical, R′ is a monovalent hydrocarbon radical and x, y vary such that the polymer has a viscosity varying from 1500 to 24,000 centipoise at 25° C. in which the polymer has a silanol content that varies from 650 to 2,400 parts per million and a vinyl content that varies from 0.1 to 2% by weight; (B) from 1 part per million to 2 parts by weight of a catalyst selected from the class consisting of platinum catalysts and tin soaps of carboxylic acids; (C) from 50 to 300 parts of water; and (D) from 5 to 80 parts by weight of emulsifying agents; (2) emulsifying a hydride polysiloxane; (3) adding the emulsion of the hydride polysiloxane to the emulsion of the vinyl-containing polymer such that there is present from 1 to 30 parts by weight of the hydride polysiloxane for 100 parts of the vinyl-containing polymer to form an emulsion mixture; (4) applying the emulsion mixture to paper; and (5) allowing the foregoing emulsion mixture to cure.

4,190,689

POLYMERIC-SHAPED ARTICLE

Saburo Fujita, Otsu; Masahiko Motegi, Hikone; Satoru Okamoto, Otsu; Atsuhiko Soda, Otsu, and Masakazu Inoue, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 17, 1978, Ser. No. 878,837

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—20 **11 Claims**

1. A polymeric shaped article comprising means for increasing the slip characteristics of said article without causing any significant increase in the haze of said article, said means comprising a plurality of small isolated nodules or spots of TiO_2 which are bonded to a surface of said article, said nodules or spots being independently bonded to said surface, and having the form of a circle or an ellipse, the diameters of said TiO_2 nodules or spots being on the order of from about 0.01 to about 10 μm when microscopically observed in a flat condition, the thickness of each said nodule or spot being from about 0.01 to about 0.5 μm, and the area ratio of said nodules or spots to the total surface area being about 0.01 to about 50%.

4,190,690

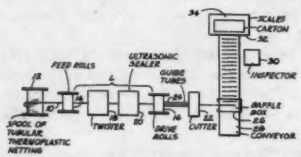
MANUFACTURE OF SEALED-END TUBULAR THERMOPLASTIC NET BAGGING

Kenneth H. Rabeneck, Louisville; Jerry R. Kantlehner, and David E. Gallaher, both of Prospect, all of Ky., assignors to Gallaher, Kantlehner & Associates, Inc., Louisville, Ky.

Filed Sep. 22, 1978, Ser. No. 945,020

Int. Cl.[2] B29C *17/00;* **B29D** *31/00;* **B29E** *27/00*

U.S. Cl. 428—35 **16 Claims**



1. A method for manufacturing sealed end unfilled tubular thermoplastic net bagging from a continuous rope-like feedstock of tubular thermoplastic net bagging material, comprising performing the following steps, repetitively, in alternation:

(a) axially advancing said feedstock through a snug-fitting aperture of a twisting station, intermittantly pausing, gripping, and angularly twisting said feedstock at said twisting station, sufficiently to substantially fully radially condense said feedstock in the vicinity of said twisting station; and

(b) at a sealing station which also is in the vicinity of said twisting station, following step (a), melting an axially short segment of said radially condensed feedstock into a single, massive integral seal nugget incorporating substantially all strands of said feedstock within said segment,

thereby producing a converted feedstock of tubular thermoplastic net bagging having a respective said seal nugget incorporated therein every so often.

4,190,691

TROPHY PLAQUE

Marvin Kramer, Glenview, Ill., assignor to The Alenite Corporation, Glenview, Ill.

Filed Oct. 27, 1978, Ser. No. 955,364
Int. Cl.[2] B44C 5/04; G09F 7/02
U.S. Cl. 428—67 **11 Claims**

1. A plaque comprising a base having an obverse surface, said obverse surface having a recess formed therein, a decorative member having a front face and a rear face and including mounting means extending rearwardly from said rear face, said mounting means being adapted to be press-fitted into said recess for mounting said decorative member on said base with said rear face of said decorative member against said obverse surface of said base and with said front face of said decorative member exposed to view, said decorative member having a second recess formed in said front face thereof, and indicia means disposed in said second recess.

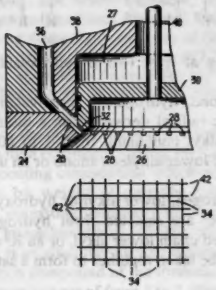
4,190,692

HIGH STRAND COUNT PLASTIC NET

Ronald L. Larsen, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Division of Ser. No. 785,862, Apr. 8, 1977, Pat. No. 4,123,491, which is a continuation-in-part of Ser. No. 653,474, Jan. 29, 1976, abandoned, and a continuation-in-part of Ser. No. 653,541, Jan. 29, 1976, Pat. No. 4,152,479, which is a continuation of Ser. No. 697,492, Jan. 12, 1968, abandoned. This application Nov. 7, 1977, Ser. No. 849,449
Int. Cl.[2] B32B 5/00
U.S. Cl. 428—107 **8 Claims**

1. An extruded porous tubular structure comprising a first plurality of extruded strands that intersect at an angle and are joined to a second plurality of extruded strands to form a tubular structure, the strands in said porous structure being



compacted to provide a net hole density equivalent to a balanced-net hole density of at least 1200.

4,190,693

COATING METHOD USING COMPOSITIONS COMPRISING ACRYLIC OLIGOMERS, HIGH POLYMERS AND CROSSLINKERS

Richard Martorano, Marlton, N.J., and William H. Brendley, Hatboro, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 587,775, Jun. 17, 1975, Pat. No. 4,126,595. This application May 15, 1978, Ser. No. 905,904
Int. Cl.[2] B32B 15/08; B05D 1/28
U.S. Cl. 428—209 **22 Claims**

1. A method of decorating a substrate comprising (a) roller coating said substrate with a composition comprising a binder consisting essentially of an aqueous alkaline blend of:

(A) a copolymer of (1) 3% to about 30% by weight of an olefinically unsaturated monomer containing a carboxyl group or a mixture thereof, (2) at least one ester of acrylic or methacrylic acid and, optionally, (3) other vinyl monomers, the total of (1), (2) and (3) being 100%, the weight average molecular weight of the copolymer being between 10,000 and 500,000, the copolymer being in the form of a solution or a colloidal solution in the aqueous blend as a salt of a volatile amine or aminonia;

(B) an oligomeric copolymer of (1) at least one ester of acrylic or methacrylic acid, (2) 9% to about 50% of an olefinically unsaturated monomer having at least one carboxyl group and, optionally, (3) other vinyl monomers, the total of (1), (2) and (3) being 100%, the weight average molecular weight of the oligomeric copolymer being between 400 and 6,000, the molecular weight distribution is such that the heterogeneity index is 3 or less, the oligomeric copolymer being in the form of a solution in the aqueous blend; and

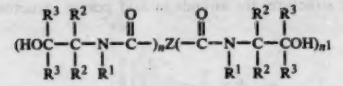
(C) a crosslinking agent selected from the group consisting of:

(a) an alcohol-modified aminoplast resin comprising the condensation product of an aldehyde and a compound selected from the group consisting of ureas, polyamides and triazines;

(b) a polyepoxide containing at least two vic-epoxy groups in which the epoxy oxygen atom is attached to adjacent carbon atoms;

(c) a polyaziridine containing at least two aziridinyl groups; and

(d) a β-hydroxyalkylamide of the formula:



containing at least two β-hydroxyalkylamide groups wherein

Z is a bond, hydrogen, a monovalent or polyvalent organic radical derived from a saturated or unsaturated alkyl containing from 1 to 60 carbon atoms, aryl, tri-lower alkylene amino or an unsaturated radical;

R^1 is hydrogen, lower alkyl or hydroxyalkyl;

R^2 and R^3 are selected from hydrogen, straight or branched chain lower alkyl, or R^2 and an adjacent R^3 can be taken together to form a saturated cycloalkyl;

n is an integer of 1 or 2; and

n^1 is an integer of 0 to 2, and when n^1 is 0 and n has a value greater than 1, a polymer of copolymer formed from the β-hydroxylakylamide when Z is an unsaturated radical,

in the form of a dispersion or solution in water; in the blend, on a solids basis, (C) being from 5 to 50 percent by weight, (A) plus (B) being from 95 to 50 percent by weight, with (A) being from 95 to 25 percent and B being from 5 to 75 percent by weight of the total of (A) plus (B), and the blend having a volatile aqueous phase comprising 70 to 95 percent by volume of water, and 5 to 30 percent by volume of volatile organic solvents, the composition having between 15 and 70 percent solids by weight, with a viscosity between 25 and 150 seconds measured in a Number 4 Ford Cup at 25° C. and (b) heating the coating until it is thermoset.

4,190,694

FIBERED SHEET MATERIAL IMITATING NATURAL LEATHER AND METHOD FOR CONTINUOUS MANUFACTURE THEREOF

Eduard Mück; Zdenek Hrabal, both of Otrokovice; Ludvik Ambroz, Brno, and Josef Horak, Gottwaldov, all of Czechoslovakia, assignors to Vyzkumny ustav kozedelny, Gottwaldova, Czechoslovakia

Continuation-in-part of Ser. No. 718,372, Aug. 27, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,303

Claims priority, application Czechoslovakia, Aug. 29, 1975, 5908-75

Int. Cl.[2] B32B *7/02, 27/00*

U.S. Cl. 428—212 **4 Claims**

1. Artificial leather comprising fibrous sheet material provided on a surface thereof with a coating formed of at least two discrete continuous layers of polyurethane elastomer, the layers of coating successively increasing from the fibrous sheet material to the uppermost coating in their respective elasticity modulus E such that the elasticity modulus E_1 of the layer adjacent to the fibered sheet material is lower than the elasticity modulus E_2, $E_3 \ldots E_{p-1}$ of any of the following layer or layers, and at the same time lower than the elasticity modulus E_p of the uppermost finish coating layer according to the relation

$$E_1 < E_2 < E_3 < \ldots < E_{p-1} < E_p$$

the values of the elasticity modulus E_1-E_p being in the range of from 12 to 170 MPa.

4,190,695

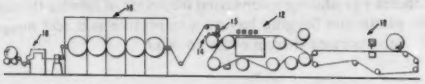
HYDRAULICALLY NEEDLING FABRIC OF CONTINUOUS FILAMENT TEXTILE AND STAPLE FIBERS

Donald O. Niederhauser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1978, Ser. No. 965,072

Int. Cl.[2] D04H *3/08*

U.S. Cl. 428—234 **8 Claims**



1. A lightweight composite fabric comprising: a substrate of continuous filaments formed into an ordered cross-directional array, said continuous filaments being well spread and having a spaced-apart relationship throughout the array in at least one direction of the array, said filaments being well spread provided that the average spacing between any bundles of filaments is no larger than the average width of said bundles of filaments, said filaments having a spaced-apart relationship provided that in the densest observed area of the filament bundle cross section the sum of the areas of the filament cross sections occupies less than 30% of the densest observed area of the cross section, said substrate being combined with staple fibers of less than 0.3 tex per filament and from about 0.5 cm to about 1 cm in length in the amount of from 20 to 50% of the weight of the composite fabric, said staple fibers extending through and entangled with said continuous filaments and having more than about 2 reversals in direction between the faces of the fabric per cm of staple fiber length; said composite fabric having an edge strength of from about 15 to 30 newtons and experiencing a loss of no more than 3% of its fiber contents during initial laundering.

4,190,696

FLAME RESISTANT, GAS RESISTANT FOAM MATERIAL

John A. Hart, Kanata, and Rolland P. Fuoco, Hull, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Nov. 7, 1978, Ser. No. 958,495

Claims priority, application Canada, Dec. 30, 1977, 294163

Int. Cl.[2] B05D *5/00*; B32B *3/26*

U.S. Cl. 428—306 **20 Claims**

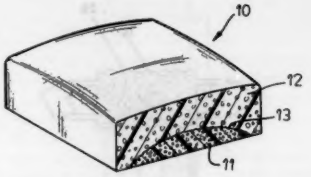
16. A laminated fabric material comprising an air and water vapour-permeable open cell solid resin foam resistant to passage therethrough of noxious chemicals in liquid or vapour form, said foam containing a particulate adsorbent material for the noxious chemicals dispersed therein, the particulate adsorbent material being bonded in said foam by an organic binder and a fire-retarding agent selected from the group consisting of ammonium orthophosphate dibasic, ammonium orthophosphate monobasic, sodium orthophosphate dibasic, ammonium polyphosphate and calcium orthophosphate monobasic impregnated therein, wherein said binder and said fire-retarding agent are substantially free from substances which would substantially deactivate said adsorbent material, and an air-and water vapour-permeable fabric backing to which the foam is bonded.

4,190,697

MULTIDENSITY FOAM ARTICLE AND METHOD OF PREPARATION

John R. Ahrens, Dousman, Wis., assignor to Milsco Manufacturing Company, Brown Deer, Wis.

Filed Jan. 15, 1979, Ser. No. 3,374
Int. Cl.[2] B32B *3/26, 5/14, 5/20*
U.S. Cl. 428—315 10 Claims



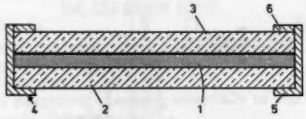
6. A multidensity foam article suitable for use as a vehicle cushion which includes a firm polyurethane foam layer and a soft polyurethane foam layer, said firm and soft layers being bonded and knitted together along their common boundary without the use of adhesives.

4,190,698

LIGHT-TRANSMITTING FIRE SCREENING PANEL

Marcel De Boel, Fontaine l'Eveque, and Pol Baudin, Chatelineau, both of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jul. 28, 1978, Ser. No. 929,203
Claims priority, application United Kingdom, Aug. 3, 1977, 32579/77
Int. Cl.[2] B32B *17/06*
U.S. Cl. 428—334 18 Claims



1. A light-transmitting fire screening panel comprising at least one sheet of glass and at least one layer of intumescent material having a thickness between 0.1 and 8 mm, the improvement which comprises said layer containing a hydrated alkali metal silicate as intumescent material and one or more adjuvants selected from the group consisting of: urea, polyhydric alcohol, monosaccaride, polysaccharide, sodium phosphate, sodium aluminate, aluminum phosphate, borax, boric acid and colloidal silica, said adjuvant being present in a proportion of less than 20% by weight of the layer.

13. A light-transmitting fire screening panel comprising at least one sheet of glass and at least one layer of intumescent material having a thickness between 0.1 and 8 mm, the improvement which comprises said layer containing a hydrated alkali metal silicate as intumescent material in combination with one or more adjuvants selected to allow accelerated drying of the layer selected from the group consisting of glycerine and ethylene glycol, said adjuvant being present in a proportion of less than 20% by weight of the layer.

4,190,699

METHOD FOR THE IMPROVEMENT OF SURFACE HARDNESS OF ARTICLE BY COATING

Hiroyuki Kanazawa, and Mikio Futagami, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited and Nippon Sheet Glass Co., Ltd., both of Osaka, Japan

Filed May 3, 1978, Ser. No. 902,736
Claims priority, application Japan, May 10, 1977, 52-53946
Int. Cl.[2] B05D *1/36;* B32B *27/08, 27/32, 15/08*
U.S. Cl. 428—412 12 Claims

1. A method for the improvement of the surface hardness of a base material which comprises coating the surface of the base material with a coating composition which comprises:

(A) 100 parts by weight of partially hydrolyzed silicon compounds consisting essentially of co-partial hydrolyzates of a tetraalkoxysilane of the formula $Si(OR^1)_4$ wherein R^1 is an alkyl having 1 to 4 carbon atoms and an organic silicon compound of the formula: $R_n{}^2Si(OR^3)_{4-n}$ wherein n is an integer of from 1 to 3, R^2 is a hydrocarbon group having 1 to 6 carbon atoms and R^3 is an alkyl having 1 to 4 carbon atoms and/or a mixture of partial hydrolyzates of each tetraalkoxysilane and organic silicon compound, said partially hydrolyzed silicon compounds containing said partially hydrolyzed tetraalkoxysilane, calculated as SiO_2, and said organic partially hydrolyzed silicon compound calculated as $R_n{}^2SiO_m$ wherein $m=(4-n)/2$) in the ratio of 5/95 to 95/5 by weight, and the weight (100 parts by weight) of said partially hydrolyzed silicon compounds being also calculated as SiO_2 for said partially hydrolyzed tetraalkoxysilane and as $R_n{}^2SiO_m$ for said partially hydrolyzed organic silicon compound,

(B) 10 to 400 parts by weight of at least one member selected from the group consisting of a copolymer of at least one of an N,N-di-alkylaminoalkyl acrylate an N,N-dialkylaminoalkyl methacrylate, an N,N-dialkylacrylamide and an N,N-dialkyl-methacrylamide and at least one of a hydroxyalkyl acrylate, a hydroxyalkyl methacrylate, an alkyl acrylate and an alkyl methacrylate; and a monomer or oligomer having two or more hydroxy groups, and

(C) 0 to 300 parts by weight of an etherified methylolmelamine, provided that when the component (B) is the monomer or oligomer having two or more hydroxy groups, said etherified methylolmelamine is contained in an amount of 0.5 to 1.5 gram equivalent per 1 gram equivalent of the monomer or oligomer, which are dissolved in a solvent.

4,190,700

HIGH SOLIDS THERMOSETTABLE COATING COMPOSITIONS CONTAINING 1,4-DIMETHYLOLCYCLOHEXANE AND POLYOXYPROPYLENE POLYOL

George J. Anderson; J. Owen Santer, both of East Longmeadow, and Timothy F. Desmond, Winchester, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

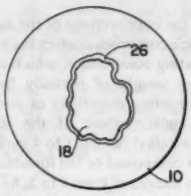
Filed May 15, 1978, Ser. No. 905,700
Int. Cl.[2] C08L *61/24*
U.S. Cl. 428—524 23 Claims

1. A liquid composition comprising 1,4-dimethylolcyclohexane, a polyoxypropylene polyol containing from about 3 to about 6 hydroxyls per molecule, of molecular weight in the range of about 500 to about 1000 and an alkylated urea-formaldehyde condensate of average degree of condensation of about 3 or less, alkylated with a C_1 to C_4 alcohol, wherein the molar ratio of urea:formaldehyde:alcohol of the alkylated ureaformaldehyde condensate is in the range of about 1:2-3:1-2.5, wherein the weight ratio of polyoxypropylene polyol to 1,4-dimethylolcyclohexane is less than about 6:1, and wherein the ratio of hydroxyl groups of the 1,4-dimethylolcyclohexane and the polyoxypropylene polyol to alkoxymethyl groups of the alkylated urea-formaldehyde condensate is in the range of about 1:0.7 to about 1:2.5.

4,190,701
V_3GA COMPOSITE SUPERCONDUCTOR

David G. Howe, Greenbelt, Md., and Donald U. Gubser, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 6, 1979, Ser. No. 27,691
Int. Cl.² H01L 39/00; H01B 12/00; H01V 11/00
U.S. Cl. 428—662 14 Claims

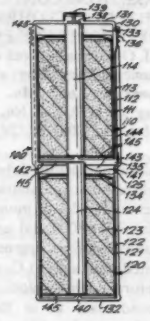


1. A composite supreconductor which comprises;
a core of an alloy consisting of a vanadium-base ternary alloy having from about 1 to 9.5 atomic percent of gallium, and from about 0.1 to about 2.5 atomic percent of titanium, the remainder being vanadium;
a matrix of an alloy consisting of about 12 to about 20 atomic percent of gallium and about 0.2 to about 6 atomic percent of aluminum, the remainder being copper; and
an interfacial layer of V_3Ga.

4,190,702
BATTERIES

Ching W. Pun, and Ching C. Poon, both of On Shing Industrial Bldg. 9th Fl., Fo Tan, S.T.T.L. #7, Shatin, New Territories, Hong Kong

Filed Aug. 2, 1978, Ser. No. 930,166
Claims priority, application United Kingdom, Aug. 11, 1977, 33775/77
Int. Cl.² H01M 2/00, 6/42
U.S. Cl. 429—4 7 Claims

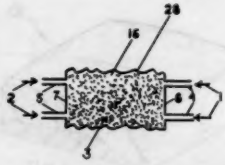


1. An electrical battery comprising a plurality of substantially cylindrical unsealed dry cells enclosed in a single sealed container comprising at least two parts made of a substantially rigid plastics material joined together along at least one plane parallel to the axes of the cells.

4,190,703
FLUIDIZED-BED ELECTRODES AND RELATED APPARATUS AND METHODS

Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Continuation-in-part of Ser. No. 813,483, Jul. 7, 1977, abandoned. This application Dec. 1, 1977, Ser. No. 856,731
Int. Cl.² H01M 8/04
U.S. Cl. 429—15 10 Claims

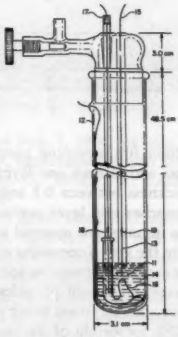


1. Apparatus comprising a fluidized-bed electrode, and pairs of opposing jets of fluid impinging against each other and thereby imparting swirling motions to the particles of the fluidized bed.

4,190,704
PROTECTED CALCIUM ANODE

Melvin H. Miles; Aaron N. Fletcher, and Dwight A. Fine, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1979, Ser. No. 8,997
Int. Cl.² H01M 4/36
U.S. Cl. 429—103 9 Claims



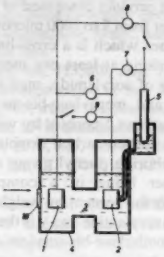
1. An electrochemical cell, comprising:
an electrolyte consisting of molten nitrate;
a cathode immersed in said electrolyte;
an anode consisting of calcium immersed in said electrolyte; and
a controllable passivating layer of CaO on said anode for restricting the corrosive reaction of said molten nitrate electrolyte with said anode.

4,190,705

PHOTOGALVANIC CELL COMPRISING COMPLEXING AGENTS

Josephina C. M. Brokken-Zijp, and Foppe J. Reinders, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 24, 1978, Ser. No. 936,449
Int. Cl.² H01M 6/30, 6/36
U.S. Cl. 429—111 11 Claims



1. A reversible photogalvanic cell for use in the conversion of light energy into electricity containing a set of electrodes immersed in an acidic aqueous electrolyte solution, said set of electrodes comprising at least one electrode which is adapted to be maintained in a light-irradiated portion of the solution and at least one electrode which is adapted to be maintained in a dark portion of the solution, and said solution comprising (a) at least one photo-reducible dyestuff, (b) both higher and lower valent ions of at least one redox couple of metals, and (c) at least one complexing agent for the higher valent ion of the redox couple selected from the class consisting of fluoride ion, phosphate ion, citrate ion, oxalate ion, and 2-aminopropionate ion.

4,190,706

SOLID STATE CELL WITH ALKALI METAL HALO-ALKALI THIOCYANATE ELECTROLYTE

Bhaskara M. L. Rao, Fanwood, and Bernard G. Silbernagel, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 1, 1979, Ser. No. 16,492
Int. Cl.² H01M 10/36
U.S. Cl. 429—191 11 Claims

1. An electric current-producing cell, comprising:
(a) an alkali metal-containing anode;
(b) a cathode; and,
(c) a solid electrolyte consisting essentially of one or more compounds of the formula:

$$(AX)_nA'SCN$$

wherein A and A' are alkali metals and may be the same or different, wherein X is one or more halogens and wherein n is a value such that $0.1 \leqq n \leqq 10$.

4,190,707

ALKALINE BATTERY SEPARATOR

Yoshinao Doi, Kawasaki; Mitsuo Kohno, Yokohama, and Katsumi Yoshitake, Yokosuka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1978, Ser. No. 948,162
Claims priority, application Japan, Oct. 3, 1977, 52-117860
Int. Cl.² H01M 2/16
U.S. Cl. 429—254 36 Claims

1. An alkaline battery separator made of a porous film which consists substantially of a polyolefin having a weight average molecular weight of less than 300,000 and a number average molecular weight of 15,000 or more and which has a thickness of 0.025 to 1 mm, a porosity of 50 to 80%, an average pore diameter of 0.05 to 0.5μ, an average ratio of the larger dimension to the smaller dimension of the pore opening of not more than 2 and an electrical resistance of 0.00005 to 0.0005Ω dm^2/0.1 mm.

4,190,708

PRODUCTION OF UROKINASE

Mau-Jung Kuo, Creve Coeur; Margaret J. Reents, Chesterfield, and Joseph Feder, University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 24, 1978, Ser. No. 909,137
Int. Cl.² C07G 7/026
U.S. Cl. 435—215 4 Claims

1. In a process for the production of urokinase by the culture of live kidney cells in an aqueous nutrient medium, the improvement which comprises adding phenylalanine in an elevated amount of from about 0.3 to about 0.7 weight percent to the said nutrient medium to thereby increase the yield of urokinase.

4,190,709

MERCURY AND COPPER SELECTIVE METAL CHELATING RESINS

Jonathan H. Hodgkin, Burwood, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

Filed May 23, 1978, Ser. No. 908,820
Claims priority, application Australia, Jun. 2, 1977, PD0336
Int. Cl.² B01D 15/04; C06G 14/06
U.S. Cl. 521—39 12 Claims

1. A cross-linked, metal-chelating resin, selective for mercury and copper consisting of a polymer produced by the condensation of a phenolic component comprising one or more phenols, formaldehyde, and a diamino component consisting essentially of one or more di-(secondary amino) compounds under neutral conditions.

4,190,710

BLOWING AGENTS BASED ON UREA DICARBOXYLIC ACID ANHYDRIDE

Kurt Ley, Odenthal-Gloebusch; Hermann Hagemann, Cologne, and Helmut Hurnik, Opladen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 616,523, Sep. 25, 1975, Pat. No. 4,104,195.
This application Mar. 22, 1978, Ser. No. 889,063
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1974, 2452740
Int. Cl.² C08J 9/10
U.S. Cl. 521—89 4 Claims

1. A process for the production of a foamed thermoplastic mass comprising mixing a thermoplastic with a blowing agent comprising urea dicarboxylic acid anhydride, and heating the resulting mixture to a temperature from about 150° to 350° C. thereby to effect foaming.

4,190,711

THERMOPLASTIC POLYETHER POLYURETHANE ELASTOMERS

Richard J. Zdrahala, and Frank E. Critchfield, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 838,017
Int. Cl.² C08G 18/48; C07C 125/04; C08G 18/14
U.S. Cl. 521—112 36 Claims

1. A process for producing a solid or microcellular polyether polyurethane elastomer which comprises reacting a reaction mixture containing:
(a) a liquid polyurethane quasi-prepolymer having a free NCO content of from about 16 percent to about 25 per-

cent in an amount that provides from 0.8 to 1.1 isocyanato groups per active hydrogen group in the reaction mixture, produced by reacting a poly(oxypropylene-oxyethylene)-diol having a molecular weight of at least 500 with an aromatic diisocyanate,

(b) a poly(oxypropylene-oxyethylene) diol having a molecular weight of at least 1000, having terminal oxyethylene groups, and having a primary hydroxyl content of at least 50 mole percent,

(c) from 5 to 75 parts by weight of a diol extender selected from the group consisting of short-chain alkane diols and short-chain oxyalkylene glycols per 95 to 25 parts by weight of (b), and

(d) a catalytic amount of catalyst for curing

the reaction mixture to produce the elastomer.

33. A liquid polyurethane quasi-prepolymer having a free NCO content of from about 16 percent to about 25 percent that is produced by reacting a poly(oxypropyleneoxyethylene) diol having a molecular weight of at least 500 with an aromatic diisocyanate.

4,190,712

LOW DENSITY ENERGY MANAGEMENT URETHANE FOAM

Kirby E. L. Flanagan, Rochester, N.H., assignor to McCord Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 746,826, Dec. 2, 1976, Pat. No. 4,116,893, which is a continuation-in-part of Ser. No. 481,498, Jun. 21, 1974, abandoned. This application Aug. 25, 1978, Ser. No. 936,815

Int. Cl.[2] C08G *18/63, 18/65*

U.S. Cl. 521—137 **2 Claims**

1. An impact energy-absorbing urethane foam made from the following formulation:

	Parts by Weight
Polymer polyol	70 to 90
Polybutadiene polymer	10 to 120
Crosslinker	10 to 40
Water	1 to 5
Prepolymer	To yield 90–115% Index
Catalyst	0 to 2

wherein:

said polymer polyol has a molecular weight in the range of 4000 to 8000 and comprises in the range of 2 to 6 parts of a poly (C_2–C_4 oxyalkylene) triol reacted with one part of a vinyl aromatic/olefinic C_3–C_7 nitrile monomer mixture;

said polybutadiene polymer is a hydroxy terminated polybutadiene homopolymer having a molecular weight in the range of 2000 to 4000, a functionality in the range of 2 to 3, and an equivalent weight in the range of 750 to 1750;

said crosslinker is a polyol having a functionality in the range of 2 to 6 and an equivalent weight in the range of 50 to 150;

said prepolymer is a reaction product of (a) an aromatic diisocyanate having one isocyanato group per aromatic nucleus and (b) a polyol having a molecular weight in the range of 100 to 1000, a functionality in the range of 2 to 6, an equivalent weight in the range of 30 to 150, and said prepolymer has a free isocyanate content in the range of 20 to 35 percent; and

said urethane foam being prepared in a closed mold and having a density in the range of 4 to 15 lbs./ft.^{3}, a specific energy at 50% C/D greater than 15 in.-lbs./in.^{3} at 70° F. and 7 PCF, a temperature index −20°/125° F. of less than 5 and suffering less than a 3% impact set when impacted to a strain of 75% at 70° F. after allowing recovery for 30 minutes at 70° F.

4,190,713

PEARL POLYMER CONTAINING HOLLOW PEARLS

Dieter Kraemer, Mainz; Hermann Plainer, and Waldemar Schleier, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 15, 1978, Ser. No. 905,892

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722751

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—149 **12 Claims**

1. A pearl polymer product composed of hollow pearl particles having a diameter from 5 to 1000 microns and consisting of a cross-linked polymer which is a cross-linked homopolymer or copolymer comprising at least one member selected from the group consisting of acrylamide, methacrylamide, methylene-bis-acrylamide and methylene-bis-methacrylamide, said polymer containing at least 5 percent by weight of a monomer having at least two carbon-carbon double bonds which are activated by a neighboring phenyl group or carbonyl group, said polymer further being of a composition such that $x+3y \geqq 40$, where x is the percent by weight in the polymer of acrylamide and methacrylamide and y is the percent by weight in the polymer of methylene-bis-acrylamide and methylene-bis-methacrylamide.

4,190,714

POWDER COATING RESIN PROCESS CONTAINING AN AROMATIC CARBONAMIDE CONDENSATE

Robert A. Isaksen, Chardon, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 715,486, Aug. 18, 1976, Pat. No. 4,133,843, which is a continuation-in-part of Ser. No. 511,953, Oct. 4, 1974, Pat. No. 3,980,732, which is a continuation-in-part of Ser. No. 318,292, Dec. 26, 1972, abandoned. This application Mar. 17, 1978, Ser. No. 887,892

Int. Cl.[2] C08L *61/32*

U.S. Cl. 525—163 **5 Claims**

1. A process for preparing a curable powder resin composition with a sintering temperature above 40° C. and curable in the temperature range of 120° to 220° C., comprising:

(A) Condensing a methylolamino compound with an aliphatic alcohol and an aromatic carbonamide of number average molecular weight less than 500 to produce an aminoplast condensate with a glass transition temperature in the range of −10° C. to 100° C., wherein the methylolamino compound is selected from the group consisting of methylolureas and methylolaminotriazines and contains no more than one unmethylolated N—H bond per molecule, wherein the aliphatic alcohol contains from 1 to 4 carbon atoms, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the aromatic carbonamide, wherein the molar ratio of the aliphatic alcohol to the methylolamino compound is at least 2, and wherein the molar ratio of the methylolamino compound to the aromatic carbonamide is from about 1:0.5 to about 1.2 when the aromatic carbonamide contains one reactive group per molecule and is from about 1:0.5 to about 1:1.5 when the aromatic carbonamide contains 2 or more reactive groups per molecule,

(B) Blending from about 15 to about 30 parts by weight of the aminoplast condensate with from about 85 to 70 parts by weight of a polyester resin or an acrylic resin, wherein the resin has a glass transition temperature in the range of from 60° to 100° C. and a number average molecular weight in the range of 500 to 25,000 and contains alcoholic hydroxyl groups, carboxyl groups or amide groups heat reactive with the aminoplast condensate, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and

wherein the acrylic resin contains from 0.13 to 18 weight percent of hydroxyl, carboxyl or amide groups, and

(C) Crushing the blend to form a powder of average particle size in the range of 20 to 150 microns.

4,190,715
POWDER COATING RESIN COMPOSITION CONTAINING A DICARBONAMIDE OR POLYCARBONAMIDE CONDENSATE

Robert A. Isaksen, Chardon, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 715,488, Aug. 18, 1976, Pat. No. 4,102,943, which is a continuation of Ser. No. 511,953, Oct. 4, 1974, Pat. No. 3,980,733, which is a continuation-in-part of Ser. No. 317,901, Dec. 26, 1972, abandoned. This application Mar. 17, 1978, Ser. No. 887,898

Int. Cl.[2] C08L *61/32*

U.S. Cl. 525—163 5 Claims

1. A curable powder resin composition with a sintering temperature above 40° C. and curable in the temperature range of 120° to 220° C., comprising:

(A) from about 15 to 30 parts by weight of a condensate of a methylolamino compound, an aliphatic alcohol containing from 1 to 4 carbon atoms and a reactive aliphatic dicarbonamide or polycarbonamide of number average molecular weight less than 500; wherein the methylolamino compound is a methylolurea or methylolaminotriazine containing no more than one unmethylolated N-H bond per molecule, wherein the molar ratio of aliphatic alcohol to methylolamino compound is at least 2, wherein the molar ratio of the methylolamino compound to the aliphatic dicarbonamide or polycarbonamide is from about 1:0.5 to about 1:1.5, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the aliphatic dicarbonamide or polycarbonamide and wherein the glass transition temperature of the condensate is in the range of from −10° C. to 100° C.; and

(B) from about 85 to 70 parts by weight of a polyester resin or an acrylic resin wherein the resin has a glass transition temperature in the range of from 60° to 100° C., and a number average molecular weight in the range of 500 to 25,000, and contains alcoholic hydroxyl groups, carboxyl groups or amide groups, heat reactive with the condensate of the methylolamino compound, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains from 0.13 to 18 percent by weight of hydroxyl, carboxyl, or amide groups.

4,190,716
POLYMERIC AGENT FOR RELEASING 5-AMINOSALICYLIC ACID OR ITS SALTS INTO THE GASTROINTESTINAL TRACT

Thomas M. Parkinson; Joseph P. Brown, and Robert E. Wingard, Jr., all of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Dec. 20, 1978, Ser. No. 971,609

Int. Cl.[2] C08F *8/32*; A61K *31/785*; C08G *63/76, 85/00*

U.S. Cl. 525—334 10 Claims

1. A polymeric compound which comprises a pharmacologically acceptable organic polymer backbone comprising a plurality of aromatic rings and having a molecular size which precludes the backbone's absorption from the intestinal lumen and a plurality of salicylic acid or salicylate salt groups covalently bonded to said backbone via azo groups that are intermediate backbone aromatic carbons and salicylic acid or salicylate salt 5-position carbons.

4,190,717
PROCESS FOR PRODUCING POLYMER FROM QUATERNIZED ACRYLATE MONOMER

Naoyuki Suzuki; Yoji Wada; Akihisa Furuno, all of Yokohama, and Masao Ishii, Tokyo, all of Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

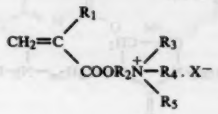
Division of Ser. No. 687,298, May 13, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,157

Claims priority, application Japan, May 16, 1975, 50/57434; May 24, 1975, 50/61474

Int. Cl.[2] C08F *2/02, 2/16*

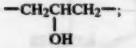
U.S. Cl. 526—62 28 Claims

1. A process for producing a cationic polymer, which consists essentially of polymerizing in bulk a vinyl monomer represented by the general formula,

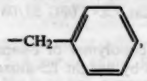


(I)

wherein R_1 represents —H or —CH_3; R_2 represents —CH_2CH_2— or



R_3 and R_4 represent —CH_3 or —CH_2CH_3; R_5 represents —C_nH_{2n+1} in which n is an integer from 0 to 4,



or —CH_2COOH; and X^- represents Cl^-, $CH_3SO_4^-$, $CH_3SO_3^-$, or $\frac{1}{2}\ SO_4^{--}$, either alone or in admixture with up to 25% by weight, based on the total weight of the monomers, of other polymerizable vinyl monomers by use of polymerization initiator in the presence of 7 to 18% by weight, based on the weight of the polymerization system, of water, in the presence of crystals of the monomer (I), effecting the final stage of the polymerization at 110° to 150° C., thereby obtaining the water-soluble cationic polymer in the form of a lump.

4,190,718
PROCESS FOR INCREASING MOLECULAR WEIGHT OF VINYLPYRROLIDONE POLYMER

Donald H. Lorenz, Basking Ridge, N.J.; Earl P. Williams, Pen Argyl, Pa., and Herman S. Schultz, Lexington, Mass., assignors to GAF Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,375

Int. Cl.[2] C08F *26/10*

U.S. Cl. 526—207 15 Claims

1. In a process for the polymerization of N-vinylpyrrolidone in a liquid medium with a free radical polymerization initiator in a reaction zone, the improvement which comprises: forming a liquid mixture comprising N-vinylpyrrolidone monomer, at least an equivalent amount up to 3.5 parts by weight per part of monomer of a saturated aliphatic hydrocarbon of 5 to 20 carbon atoms as a suspension medium, a suspension aid, and a controlled amount between about 1% by weight and about 35% by weight of water per weight of monomer in the mixture; agitating said liquid mixture to form a suspension of N-vinylpyrrolidone liquid globules and reacting said N-vinylpyrrolidone in suspension to produce a solid polymer of N-

vinylpyrrolidone having a number-average molecular weight of at least 200,000.

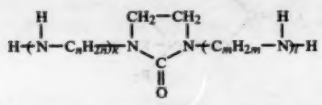
4,190,719

IMIDAZOLIDONE POLYAMINES AS EPOXY CURING AGENTS

Hiroshi Samejima, and Kaoru Kanayama, both of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jul. 5, 1978, Ser. No. 922,251
Claims priority, application Japan, Jul. 4, 1977, 52-79023
Int. Cl.[2] C08G *59/54*
U.S. Cl. 528—103 **30 Claims**

1. A curable epoxy resin composition comprising (a) an epoxy resin and (b) an epoxy resin curing agent, wherein the epoxy resin curing agent is an epoxy resin curing agent represented by the formula (I):



(I)

wherein k, m and n, which may be the same or different, each is an integer of 1 to 6, and l is an integer of 0 to 6, and/or a modified product thereof.

4,190,720

ISOMORPHIC COPOLYMERS OF ε-CAPROLACTONE AND 1,5-DIOXEPAN-2-ONE

Shalaby W. Shalaby, Lebanon, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Dec. 26, 1978, Ser. No. 972,757
Int. Cl.[2] C08G *63/08*
U.S. Cl. 528—354 **12 Claims**

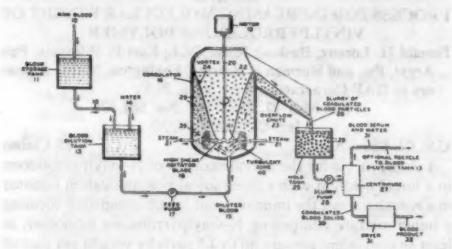
1. An isomorphic copolymer of ε-caprolactone with from about 3 to 15 percent by weight 1,5-dioxepan-2-one.

4,190,721

PROCESS FOR RECOVERING PROTEINS AND POLYMERS FROM LIQUIDS CONTAINING SAME

Douglas L. Hertel, Strongsville, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.

Division of Ser. No. 795,932, May 11, 1972, abandoned, which is a continuation of Ser. No. 590,826, Jun. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 440,196, Feb. 6, 1974, abandoned. This application Jun. 5, 1978, Ser. No. 912,850
Int. Cl.[2] C08J *3/16*
U.S. Cl. 528—486 **6 Claims**



1. In a process for coagulating a polymeric latex which comprises treating the latex with a coagulating agent for the latex:

the improvement which comprises agitating a mass of liquid with a high shear agitator blade operating at a tip speed of about 1500 to 6500 feet per minute to produce in the liquid a localized toroidal turbulent zone at and concentric with the tip of the agitator blade, said localized toroidal turbulent zone having an annular outer boundary and a concentric annular inner boundary below said agitator blade; introducing a first continuous stream of said latex into said localized toroidal turbulent zone through one of said boundaries; introducing a second separate and continuous stream containing said coagulating agent for said latex and an anionic surfactant into said localized toroidal turbulent zone through the remaining one of said boundaries so that said streams initially contact and mix in said turbulent zone to produce a slurry of finely divided coagulated polymer particles; and continuously withdrawing said slurry of polymer particles from said turbulent zone.

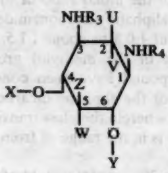
4,190,722

4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS, PROCESS FOR THEIR PRODUCTION AND THEIR USE

Eckart Voss, Cologne; Peter Stadler, Haan; Uwe Petersen; Hans-Joachim Kabbe, both of Leverkusen, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,135
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726197; Jun. 10, 1977, 2726208
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 536—17 R **14 Claims**

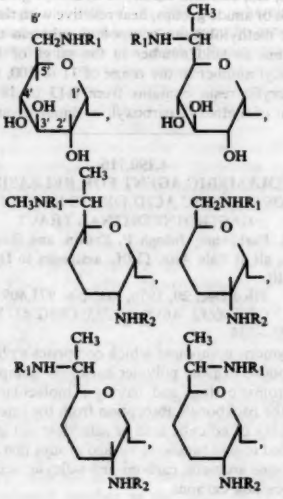
1. A member selected from the group consisting of a selectively protected diaminocyclitol and its pharmaceutically acceptable salts of the following formula (I),



(I)

in which

X represents a radical of the formula



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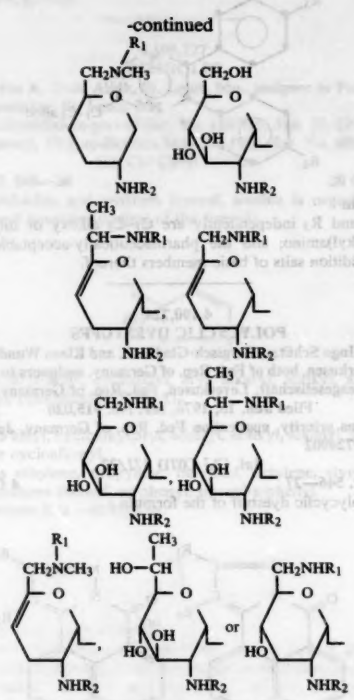
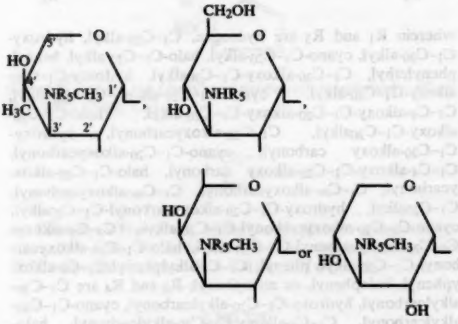


Y designates a radical of the formula



U, V and W are the same or different and each is hydrogen or hydroxyl; Z is hydrogen, hydroxyl or amino;

(1) R_1, R_2, R_3, R_4 and R_5 are each hydrogen or a radical —SR′ with at least one being other than hydrogen, wherein R′ is phenyl substituted by from one to three substituents each of which is nitro, C_1 to C_4-alkyl, C_1 to C_4-alkoxy, C_1 to C_4-alkoxycarbonyl, phenyl, by from 1 to 5 halogen atoms, diphenylmethyl or triphenylmethyl or

(2) wherein R_5 is hydrogen and R_1, R_2, R_3 and R_4 are ethoxycarbonyl or acetyl.

4,190,723

SUBSTITUTED PYRIDINES AND PROCESS FOR MAKING THEM

Horst Tappe, Dietzenbach, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

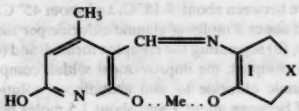
Division of Ser. No. 819,756, Jul. 29, 1977, Pat. No. 4,157,446. This application Oct. 25, 1978, Ser. No. 954,441

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635205; Aug. 5, 1976, 2635206

Int. Cl.² C07D *213/53*

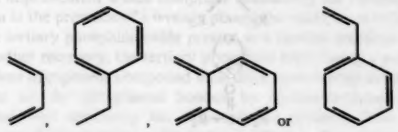
U.S. Cl. 542—422 **5 Claims**

1. Metal complex compounds of the formula



wherein

X is



and the benzene or naphthalene ring formed by X and the remaining portion of the molecule is unsubstituted or substituted with one or two substituents selected from the group consisting of methyl, methoxy, chloro, bromo, trifluoromethyl, nitro, cyano, —$CONR_1R_2$ and —$COOR_3$ substituents, wherein R_1 and R_2 are the same or different and each is hydrogen or alkyl having 1 to 4 carbon atoms, R_3 is alkyl having 1 to 4 carbon atoms, and Me is nickel, copper, zinc or cobalt.

4,190,724

PROCESS FOR 3-EXOMETHYLENECEPHAM SULFOXIDES

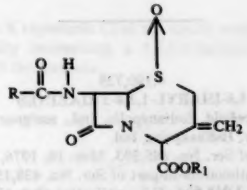
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 13, 1978, Ser. No. 960,346

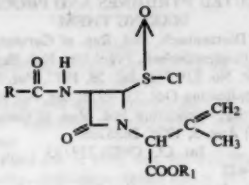
Int. Cl.² C07D *501/02*

U.S. Cl. 544—16 **10 Claims**

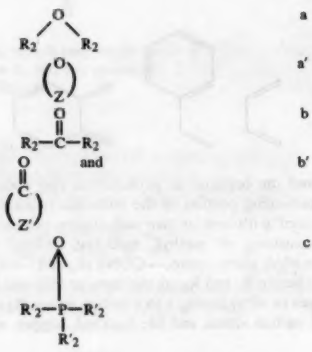
1. In the process for preparing a 3-exomethylenecepham sulfoxide ester of the formula



wherein R is the residue of a carboxylic acid and R_1 is a carboxylic acid protecting group, which comprises the steps, (a) adding to a solution of a 2-chlorosulfinylazetidin-4-one of the formula



in an inert organic solvent under anhydrous conditions at a temperature between about −15° C. and about 45° C., between about 2 and about 3 moles of stannic chloride per mole of said azetidinone; (b) separating the complex formed; and (c) decomposing said complex; the improvement which comprises adding the stannic chloride to said azetidinone solution in the presence of between about 1 and about 1.5 moles per mole of said azetidinone of an oxo compound selected from the group consisting of



a

a'

b

and

b'

c

wherein the above formulas each R_2 is independently C_1–C_4 alkyl; each R'_2 is independently C_1–C_4 alkyl, C_5 to C_6 cycloalkyl, phenyl or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, or halogen; Z is $-(CH_2)_m-$, $-CH_2-CH_2-O-CH_2-CH_2-$, or $-CH_2-O-CH_2-CH_2-CH_2-$; m is 4 or 5; and Z' is

wherein each of R_2^* is hydrogen or C_1–C_4 alkyl, and n is 3 to 6.

4,190,725

5,6-DIARYL-1,2,4-TRIAZINES

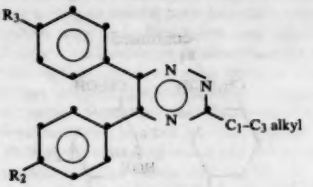
William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 665,593, Mar. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 438,156, Jan. 31, 1974, Pat. No. 3,948,894. This application Oct. 18, 1978, Ser. No. 952,375

Int. Cl.² C07D *253/06*

U.S. Cl. 544—182 **5 Claims**

1. The compound of the formula,



wherein

R_2 and R_3 independently are C_1–C_3 alkoxy or di(C_1–C_3 alkyl)amino; and the pharmaceutically-acceptable acid addition salts of basic members thereof.

4,190,726

POLYCYCLIC DYESTUFFS

Detlef-Ingo Schütze, Bergisch-Gladbach, and Klaus Wunderlich, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

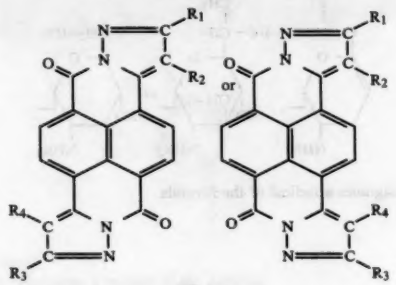
Filed Jun. 13, 1978, Ser. No. 915,020

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726902

Int. Cl.² C07D *471/22*

U.S. Cl. 546—27 **4 Claims**

1. Polycyclic dyestuff of the formula



wherein R_1 and R_3 are hydrogen, C_1–C_{20}-alkyl, hydroxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkyl, benzyl, phenylethyl, C_1–C_{20}-alkoxy-C_1–C_{20}alkyl, hydroxy-C_1–C_{20}-alkoxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkoxy-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}-alkoxy-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkoxy C_1–C_{20}alkyl, C_1–C_{20}-alkoxycarbonyl, hydroxy-C_1–C_{20}-alkoxy carbonyl, cyano-C_1–C_{20}-alkoxycarbonyl, C_1–C_4-alkoxy-C_1–C_{20}-alkoxy carbonyl, halo-C_1–C_{20}-alkoxycarbonyl, C_1–C_{20}-alkoxycarbonyl, C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}alkyl, hydroxy-C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}alkyl, cyano-C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}alkoxycarbonyl-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkoxycarbonyl-C_1–C_{20}-alkyl, phenyl, C_1–C_4-alkylphenyl,C_1–C_4-alkoxyphenyl, halophenyl, or nitrophenyl; R_2 and R_4 are C_1–C_{20}-alkylcarbonyl, hydroxy-C_1–C_{20}-alkylcarbonyl, cyano-C_1–C_{20}-alkylcarbonyl, C_1–C_4-alkoxy-C_1–C_{20}-alkylcarbonyl, halo-C_1–C_{20}-alkylcarbonyl, phenylcarbonyl, C_1–C_4-alkylphenylcarbonyl, C_1–C_4-alkoxyphenylcarbonyl, halophenylcarbonyl, nitrophenylcarbonyl, C_1–C_{20}-alkoxycarbonyl, hydroxy-C_1–C_{20}-alkoxycarbonyl, cyano-C_1–C_{20}-alkoxycarbonyl, C_1–C_4-alkoxy-C_1–C_{20}-alkoxycarbonyl, halo-C_1–C_{20}-alkoxycarbonyl, cyano, or $CONX_1X_2$ wherein

X_1 is hydrogen, C_1–C_{20}-alkyl, hydroxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}-alkyl, halo-C_1–C_{20}-alkyl, benzyl, phenylethyl, phenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, halophenyl, nitrophenyl, or cyclohexyl; and

X_2 is hydrogen, C_1–C_{20}-alkyl, hydroxy-C_1–C_{20}-alkyl, cyano-C_1–C_{20}-alkyl, C_1–C_4-alkoxy-C_1–C_{20}-alkyl, or halo-C_1–C_{20}-alkyl.

4,190,727

DITHIOLES

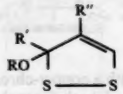
Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 156,985, Jun. 25, 1971, abandoned. This application May 13, 1976, Ser. No. 686,093

Int. Cl.² C07D *339/04*

U.S. Cl. 549—36 **20 Claims**

1. Dithioles, and mixtures thereof, soluble in organic solvents and aqueous systems, of the formula



where R is alkyl, cycloalkyl, aryl, alkaryl, aralkyl, alkenyl, alkynyl, cycloalkenyl, $R^*(OA)_z$,

where

R* is alkyl, cycloalkyl,aryl, alkaryl, aralkyl, alkenyl, alkynyl or cycloalkenyl,

A is ethylene, propylene, butylene, octylene, styrene or mixtures thereof, or phenyl, phenyl-x-phenyl,

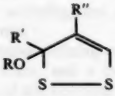
where X is $-(CH_2)_n-$,

or —S— or -phenyl-phenyl,

Z is 1–100 and n is 1–20, an "Oxo" alcohol radical, glyceryl, pentaerythrityl, dipentaerythrityl or mannityl, and

R' and R'' are alkyl, aryl, cycloalkyl, alkenyl, alkynyl, alkaryl, aralkyl, or heterocyclic groups.

5. Dithioles, and mixtures thereof, soluble in organic solvents and aqueous systems, of the formula



where R' and R'' are t-butyl and neopentyl, respectively, when R is CH_3, C_2H_5, CH_3

or $CH{\equiv}C{-}CH_2-$, are phenyl and phenyl, respectively, when R is CH_3, C_2H_5 or $CH{\equiv}C{-}CH_2$, and are phenyl and CH_3, respectively, when R is CH_3 or $CH{\equiv}C{-}CH_2$.

4,190,728

PROCESS FOR THE PRODUCTION OF LOWER ALKYL 2-CHLORO-2-HYDROXYIMINOACETATES

Ikuo Adachi, Suita; Teruo Yamamori, and Yoshiharu Hiramatsu, both of Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 11, 1978, Ser. No. 895,476

Claims priority, application Japan, May 2, 1977, 52-50939

Int. Cl.² C07C *131/00*

U.S. Cl. 560—168 **9 Claims**

1. A process for the production of a lower alkyl 2-hydroxyiminoacetate which comprises reacting chloral with a lower alkanol and a hydroxylamine salt in the presence of a Lewis acid selected from the group consisting of calcium chloride, magnesium chloride, aluminum chloride, stannic chloride, zinc chloride, titanium tetrachloride and ferric chloride or a metal oxide which is convertible into said Lewis acid during the course of the reaction selected from the group consisting of magnesium oxide and zinc oxide.

4,190,729

CARBONYLATION PROCESS WITH STABILIZED CATALYST

Denis Forster, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 19, 1977, Ser. No. 834,074

Int. Cl.² C07C *67/36*

U.S. Cl. 560—232 **17 Claims**

1. In the process for the carbonylation of methanol with carbon monoxide and hydrogen in liquid phase at temperatures in the range of 150° to 250° C. and pressures in the range of 1500 to 15,000 psi in the presence of a cobalt carbonyl catalyst, the improvement which comprises conducting the carbonylation in the presence of a tertiary phosphine oxide, so as to have the tertiary phosphine oxide present as a catalyst stabilizer for product recovery, the tertiary phosphine oxide being a pentavalent phosphorus compound with three hydrocarbyl substituents on the phosphorus bonded by carbon-to-phosphorus bonds and separating the carbonylation products from the carbonylation reaction mixture by distilling in the presence of said tertiary phosphine oxide.

4,190,730

PREPARATION OF 1,1,1-TRIHALOGENO-4-METHYL-3-PENTEN-2-OL

Fumio Mori, Kurashiki; Yoshiaki Omura, Okayama; Takashi Nishida, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

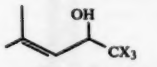
Division of Ser. No. 786,587, Apr. 11, 1977, Pat. No. 4,117,247, which is a continuation-in-part of Ser. No. 616,999, Sep. 26, 1975, abandoned. This application Mar. 28, 1978, Ser. No. 891,049

Claims priority, application Japan, Oct. 3, 1974, 49-114114; Oct. 3, 1974, 49-114115; Dec. 28, 1974, 49-2064; Dec. 28, 1974, 49-2065; Jun. 30, 1975, 50-80600

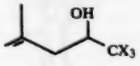
Int. Cl.² C07C *33/10*

U.S. Cl. 568—845 **9 Claims**

1. A process for preparing a 1,1,1-trihalogeno-4-methyl-3-penten-2-ol of the formula:



wherein each X represents Cl or Br, which comprises catalytically thermally isomerizing a 1,1,1-trihalogeno-4-methyl-4-penten-2-ol of the formula:



wherein each X is as defined above, at a temperature ranging from 50° C. to 250° C. in the presence of about 0.1 to 30% by weight, based on the weight of said 1,1,1-trihalogeno-4-methyl-4-penten-2-ol, of an acid catalyst.

4,190,731

PROCESS FOR WORKING UP DISTILLATION RESIDUES FROM THE HYDROFORMYLATION OF PROPENE

Rudolph Nehring; Manfred zur Hausen, and Werner Neumann, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

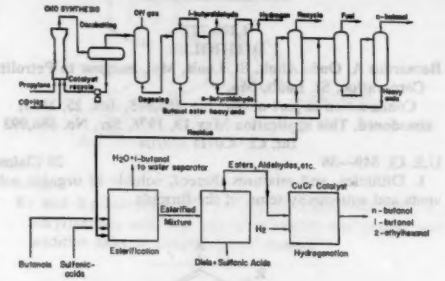
Filed Sep. 7, 1978, Ser. No. 940,294

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740216

Int. Cl.[2] C07C *29/24*

U.S. Cl. 568—914 8 Claims

1. In an oxo process wherein propene is hydroformylated and then distilled to separate n-butyraldehyde, iso-butyraldehyde, n-butanol, iso-butanol, n-butyl formate, iso-butyl formate and distillation residues having an acid number of about 80 to 130, the improvement comprising adding to the distillation residues molar to twice molar amounts, relative to the acid content, of n-butanol, iso-butanol or mixtures thereof, carrying out an esterification in the presence of catalytically active amounts of aryl or alkaryl sulphonic acids at temperatures from about 50° to 200° C., separating off the water of reaction, distilling the esterification reaction product and hydrogenating



the distillate thereof with a copper-chromite catalyst to obtain n-butanol, isobutanol and 2-ethylexanol.

ELECTRICAL

4,190,732
ELECTRICAL APPARATUS

Dudley L. Galloway, and Robert E. Donoghue, both of Jefferson Township, Cole County, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

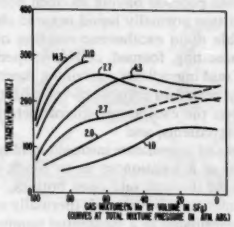
Filed Sep. 8, 1977, Ser. No. 831,461
Int. Cl.[2] H01F *27/02*
U.S. Cl. 174—17 LF 5 Claims

1. Electrical transformer apparatus comprising:
a housing;
a liquid dielectric disposed in said housing;
an electrically conductive element disposed within said housing, in said liquid dielectric, which is adapted for connection to an electrical potential;
said housing including at least a bottom member and a cylindrical side member each formed of metallic sheet material having a uniform thickness, said bottom member and cylindrical side member being concentrically disposed about a vertically extending axis, said side member having first and second ends,
said bottom member including first, second and third concentric, annular bends,
said first annular bend defining a horizontally oriented circular base portion, and a depending first annular flange portion, said circular base portion being disposed within said side member, adjacent to its second end;
said first annular flange portion extending axially from said circular base portion to said second bend, which is disposed proximate with the second end of said side member;
said second bend providing a second annular flange portion which extends outwardly from said first annular flange portion at a predetermined angle, with at least a portion thereof being disposed below the second end of said side member and further with at least a portion of the second end of said side member being in contact with said second annular flange portion to center said circular base portion of said bottom member within said side member, and to define a joint between said bottom member and said cylindrical side member on the outside of the resulting assembly with respect to the vertically extending axis;
said third annular bend providing a third annular flange portion which extends axially downward from said second annular flange portion and having a lower edge upon which said housing is supported; and
joining means disposed to join, and to seal the joint between, said side member and said second annular flange portion of said bottom member, said joining means being a weld bead.

4,190,733
HIGH-VOLTAGE ELECTRICAL APPARATUS UTILIZING AN INSULATING GAS OF SULFUR HEXAFLUORIDE AND HELIUM

Roy E. Wootton, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 21, 1977, Ser. No. 808,571
Int. Cl.[2] H01B *3/56*
U.S. Cl. 174—28 6 Claims

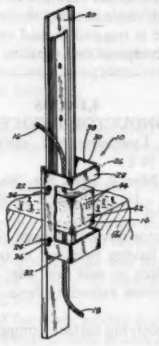


1. High-voltage electrical apparatus comprising:
an outer housing at low potential having conducting particles contaminating the interior thereof;
an inner electrode at high potential disposed within said outer housing;
support means for insulatably supporting said inner electrode within said outer housing; and
an insulating gas disposed within said outer housing and electrically insulating said inner electrode from said outer housing, said insulating gas being at a pressure within the range from about 4.3 to about 14.3 atmospheres absolute, said insulating gas comprising:
sulfur hexafluoride at a partial pressure within the range 2.9 to 3.4 atmospheres absolute; and
helium at a partial pressure within the range from about 1.1 to 11.4 atmospheres absolute.

4,190,734
CABLE PEDESTAL RODENT GUARD SYSTEM, METHOD OF CONSTRUCTING SAME, AND KIT AND COMPOSITION

John A. Dressler, Jr., Bloomfield, Iowa, assignor to Dee-Jay Independent Services Group, Inc., Bloomfield, Iowa

Filed Sep. 6, 1977, Ser. No. 830,439
Int. Cl.[2] H02G *9/02*; A01N *17/00*
U.S. Cl. 174—38 11 Claims



1. In combination, a pedestal enclosure for enclosing above ground extensions of underground cables, which defines a cable holding chamber having an open bottom adapted for

extension into the ground for access to underground cables, and

in said holding chamber, and blocking the bottom thereof a rigid, foamed, cell-developed, insulating, polymeric, thermosetting, plastic material, in which a substantial number of said cells contain encapsulated therein an effective gaseous rodent retardant.

3. A method of retarding rodent access to the interior cable holding chamber of a cable pedestal having an open bottom, said method comprising:

installing a cable pedestal having an open bottom;

mixing at least two normally liquid organic chemical ingredients capable upon exothermic reaction of providing a rigid, thermosetting, foamed, cell-developed, polymer, at least one of said ingredients containing therein a normally liquid rodent retardant capable of volatilization to a gaseous state upon the exothermic, thermosetting reaction of said other ingredients, and

pouring said mixed ingredients into said holding chamber of said pedestal at a location so as to block access to the interior thereof through said open bottom.

6. A rigid, foamed, cell-developed, thermally set, polymeric material, and encapsulated in a substantial number of the cells thereof,

a gaseous state rodent retardant for release to the environment upon rupture of said cells.

9. A kit for forming a rigid, foamed, cell-developed, polymeric, plastic material in which a substantial number of the cells encapsulate an effective volatilized rodent retardant for release upon rupture of said cells, comprising:

a first container with liquid isocyanate,

a second container with a poly ether,

at least one of said containers having a blowing agent therein, and at least one of said containers having a normally liquid rodent retardant therein which is capable of volatilization upon mixing of the ingredients of said containers, and

a flexible shipping bag containing said first and second containers.

10. A method of encapsulating, in a gaseous state, a normally liquid rodent retardant in the cell structure of a rigid, foamed, cell-developed, thermosetting, material formed by mixing two normally liquid chemical ingredients which react exothermally to provide a thermoset material, comprising:

adding to one of said chemical ingredients used in the preparation of said foamed material a normally liquid rodent retardant which is miscible therewith, and which is capable of volatilization at the exothermic reaction temperature achieved by mixing said two normally liquid ingredients;

adding said one ingredient containing said rodent retardant to the other of said ingredients;

whereby said exothermic reaction forms said rigid, foamed, cell-developed, thermosetting material, and said retardant volatilizes and is trapped in said cells of material for release upon subsequent cell rupture.

4,190,735

SEMICONDUCTOR DEVICE PACKAGE

Angelo Checki, Jr., Lyndhurst, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1978, Ser. No. 884,700

Int. Cl.[2] H05K *5/06*

U.S. Cl. 174—52 FP **18 Claims**

1. A semiconductor device package comprising:

a base member having first and second sides and a pellet mounting surface on said first side;

hermetic wall means extending from said base member on said first side;

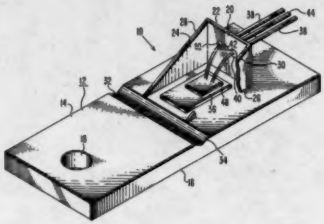
a hermetic lid-receiving surface comprising a portion of said wall means;

said wall and lid-receiving surface together surrounding said pellet mounting surface in such a manner that hermetically sealing a hermetic lid to said lid-receiving surface will enclose said pellet mounting surface in a hermetically sealed container comprising said base member, said wall means and said lid;

said lid receiving surface lying in a first geometric plane;

said pellet mounting surface lying in a second geometric plane;

said first geometric plane and said second geometric plane intersecting at an included angle of less than 90°;



at least one electrically conductive lead passing through said wall means and hermetically sealed thereto;

a semiconductor device pellet having first and second surfaces and having said first surface thereof affixed to said pellet mounting surface; and

said at least one electrically conductive lead connected to said second surface of semiconductor pellet.

4,190,736

ELECTRICAL INSULATOR AND METHOD OF MAKING SAME

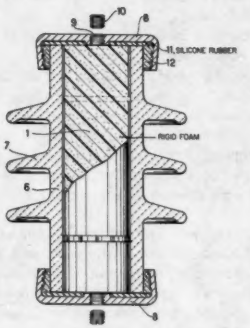
Henri Warnet, Laloubere, and Paul Fouinat, Tarbes, both of France, assignors to Societe Anonyme Dite: Ceraver, Paris, France

Filed Jul. 6, 1977, Ser. No. 813,388

Claims priority, application France, Jul. 9, 1976, 76 21088

Int. Cl.[2] H01B *17/02, 19/00*

U.S. Cl. 174—209 **6 Claims**



1. An electrical insulator comprising an independently manufactured outer tube of a dielectric material selected from the group consisting of ceramic material and wound glass fibers set in a synthetic resin, a filling of at least partially rigid independently manufactured dielectric foam material, sealing means at each end of said tube, and an adhesive interface material connecting said filling to the inner surface of the tube along the length thereof and providing a good electrical and mechanical connection between the material of the tube and that of the filling, said filling comprising at least one block of said dielectric foam material machined to a diameter close to the internal diameter of said tube, said block being stuck to the wall of said tube by a synthetic resin constituting said adhesive interface material, said block having radially projecting, integral guide

means for centering it in said tube, and said radially projecting guide means being provided with longitudinal passages about the periphery thereof for permitting the synthetic resin constituting said adhesive interface material to pass between said guide means and the inner surface of the tube.

6. A method of manufacturing an electrical insulator including the steps of:

providing an independently manufactured insulator tube,

providing at least one independently manufactured block of at least partially rigid synthetic resin foam,

machining said block to a diameter near to the internal diameter of the tube,

centering and inserting said block into said tube,

degassing a hardenable synthetic liquid polymer into a flexible resin mixed with a hardening catalyst in the liquid phase,

feeding the hardenable synthetic liquid polymer into the insulator tube via one of its ends under the effect of an applied pressure differential between the ends,

isolating said flexible resin within the interior of the insulator tube from the flexible resin being fed to the tube,

maintaining communication with a source of reduced pressure of said flexible resin within said tube after the interior of the insulator tube has been isolated for several minutes in order to complete degassing, and

finally hardening said hardenable synthetic liquid polymer.

4,190,737

COMPATIBLE FOUR CHANNEL FM SYSTEM

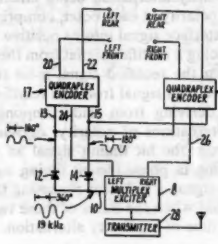
Louis Dorren, Millbrae, Calif., assignor to Matsushita Electric Corp. of America, Secaucus, N.J.

Continuation of Ser. No. 482,415, Jun. 24, 1974, Pat. No. 3,967,069, which is a continuation of Ser. No. 319,939, Dec. 29, 1972, Pat. No. 3,822,365, which is a continuation of Ser. No. 32,989, Apr. 29, 1970, Pat. No. 3,708,623, which is a continuation-in-part of Ser. No. 13,902, Feb. 25, 1970, abandoned. This application Jan. 14, 1976, Ser. No. 649,153

The portion of the term of this patent subsequent to Jan. 2, 1988, has been disclaimed.

Int. Cl.[2] H04H *5/00*

U.S. Cl. 179—1 GH **4 Claims**



1. A four channel FM system which is fully compatible with existing mono and stereo standards comprising means for producing a first combination of audio signals of a lower frequency band, means for producing a pilot signal having a frequency higher than the highest frequency of said audio signals, means for producing a second combination of said audio signals amplitude modulating a first subcarrier signal at a frequency double the frequency of said pilot signal, means for producing at least one of third and fourth combinations of said audio signals, said third combination of signals amplitude modulating a second subcarrier at a frequency double the frequency of said pilot signal and in quadrature with said second subcarrier signal, said fourth combination of said audio signals amplitude modulating a third subcarrier signal at a frequency related to the frequency of the pilot signal and different from the frequency of said first and second subcarrier, means for combining said first and second combinations of audio signals, said pilot signal and at least one of said third and fourth combinations of audio signals to produce a composite signal for use in the four channel FM system.

4,190,738

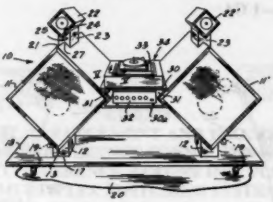
MODULAR FURNITURE STRUCTURE

George A. Samuels, 8350 S. Bennett, Chicago, Ill. 60617

Filed Feb. 6, 1978, Ser. No. 875,698

Int. Cl.[2] H04R *1/20*; A47B *47/00*

U.S. Cl. 179—1 E **19 Claims**



1. In combination in modular furniture structure:

a modular pillar block having top and bottom load bearing surfaces;

at least one of said surfaces having a recessed seat for supporting engagement with complementary surface area of a modular article of furniture;

a base;

said pillar block having its bottom load bearing surface in engagement with said base and said one surface being at the top;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat;

a second modular pillar block having top and bottom load bearing surfaces and having its bottom load bearing surface on said base spaced from said first pillar block;

the top load bearing surface of said second pillar block having a recessed seat;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat of the second pillar block;

supporting means mounted on and between said modular articles of furniture;

said modular articles of furniture having corners projecting toward one another in spaced relation;

and said supporting means carried on and between said articles comprising a shelf structure having means in supportive engagement with said corners.

7. In combination in modular furniture structure:

a modular pillar block having top and bottom load bearing surfaces;

at least one of said surfaces having a recessed seat for supporting engagement with complementary surface area of a modular article of furniture;

a base;

said pillar block having its bottom load bearing surface in engagement with said base and said one surface being at the top;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat;

a second modular pillar block having top and bottom load bearing surfaces and having its bottom load bearing surfaces on said base spaced from said first pillar block;

the top load bearing surface of said second pillar block having a recessed seat;

a modular article of furniture having a complementary surface in supportive engagement in said recessed seat of the second pillar block;

supporting means mounted on and between said modular articles of furniture;

a sound reproducing unit;
and vibration isolating cushioning means mounting said sound reproducing unit on said supporting means carried on and between said modular articles of furniture.

4,190,739

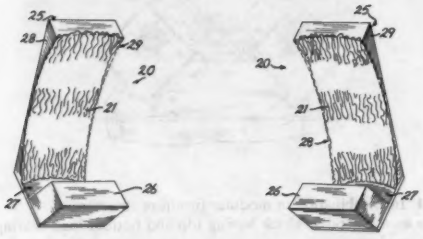
HIGH-FIDELITY STEREO SOUND SYSTEM

Marvin Torffield, 50 Greene St., New York, N.Y. 10013

Continuation-in-part of Ser. No. 791,473, Apr. 27, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,895

Int. Cl.² H04R *5/02*

U.S. Cl. 179—1 GA **11 Claims**



2. A sound reflector for use with a sound source spaced therefrom and directing sound thereto, the reflector having a sound dispersive surface forming an expanse larger than the sound source in area, and continuously roughened across its surface by peaks and valleys of varying height and depth occurring in all directions from any point within the roughened surface, said peaks and valleys that occur in all directions on the roughened surface defining a surface being adapted to disperse at least a portion of the audible frequency range impingent thereon widely through a listening area from substantially the entire roughened surface.

4,190,740

CIRCUIT ARRANGEMENT FOR RECEIVING AND TRANSMITTING SWITCHING DATA IN TELECOMMUNICATION EXCHANGES

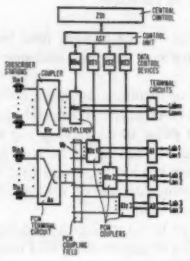
Max Schlichte, and Karlheinz Neufang, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 671,738, Mar. 30, 1976, abandoned, which is a continuation of Ser. No. 441,942, Feb. 13, 1974, abandoned, which is a continuation of Ser. No. 218,971, Jan. 19, 1972, abandoned. This application Mar. 24, 1977, Ser. No. 780,835

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1971, 2102397

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AT **3 Claims**



1. A circuit arrangement for an exchange switching center in a telecommunication system for the transmission between exchanges of switching data signals related to communication signals, each said exchange having central control means, said communication signals being transmitted as pulse code modulated signals, the circuit arrangement comprising:
a plurality of communication signal receiving/transmitting means,
a plurality of switching data receiving/transmitting means individually allocated to each of said communication signal receiving/transmitting means,
means coupling individual ones of said switching data receiving/transmitting means, respectively to individual ones of said communication signals receiving/transmitting means and
means connecting said switching data receiving/transmitting means to said central control means for controlling the operation of said exchange.

4,190,741

METHOD AND DEVICE FOR RECEIVING AN INTERFACE SIGNAL

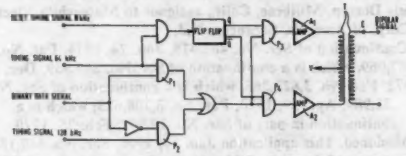
Denis F. Cointot, Paris, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Oct. 25, 1978, Ser. No. 954,536

Claims priority, application France, Oct. 28, 1977, 77 32576

Int. Cl.² H04J *3/06;* **H04L** *7/02*

U.S. Cl. 179—15 BS **2 Claims**



1. A method of receiving a codirectional interface digital signal coded in bipolar form, each data bit being represented by means of four bits (1,1,0,0) for a binary "1" and (1,0,1,0) for a binary "0", a polarity alternation being effected every bit with a violation of polarity at each octet, comprising the steps of: separating the interface signal into its positive and negative components; producing a rectified signal from the said components; deriving from the rectified signal a bit timing signal; deriving the decoded data signal from the rectified signal and the timing signal; deriving from said components a signal representing the alternations of polarity; deriving from this latter signal and from the bit timing signal an octet timing signal; and comparing in phase the bit timing signal and the polarity alternation signal, a pulse for rephasing the bit timing signal being produced when the states of these two signals do not coincide at the time of a polarity alternation.

4,190,742

PROCESS AND APPARATUS FOR PRODUCING CONFERENCE CONNECTIONS IN A PCM TIME MULTIPLEX SWITCHING SYSTEM

Gary D. Southard, Marlton, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,440

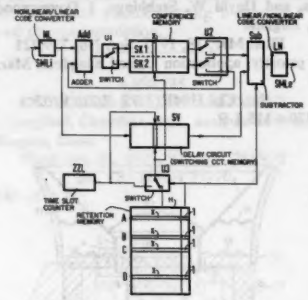
Int. Cl.² H04M *3/56*

U.S. Cl. 179—18 BC **5 Claims**

1. A process for establishing conference connections in a pulse code modulation time multiplex switching system in which total code words are constructed from code words supplied by conference parties and then transmitted to the conference parties, comprising the steps of:
receiving code words from the conference parties during their respective time slots;
delaying each received code word by one pulse frame;
adding each received code word to a previous code word

and storing the result as an intermediate code word and repeating adding and storing as each code word is received;

subtracting the delayed code word each frame from the stored result of addition to form the total code words; and



transmitting each total sum code word during the respective time slot to the conference party whose delayed code word was subtracted to obtain the respective total code word.

4,190,743

THYRISTOR SWITCHING MATRIX

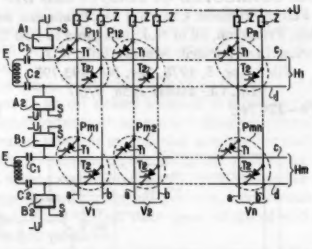
Philippe Hugel, Illkirch Graffenstaden; Henri Kraess, Strasbourg; Remi Louis, Limersheim, and Louis Vidonne, Sallanches, all of France, assignors to Societe Anonyme Dite: La Telephonie Industrielle et Commerciale-Telic, Strasbourg, France

Filed Jun. 20, 1978, Ser. No. 917,229

Claims priority, application France, Jun. 30, 1977, 77 20076

Int. Cl.[2] H04Q *3/52*

U.S. Cl. 179—18 GF **3 Claims**



1. A thyristor switching matrix comprising horizontal lines, vertical lines and thyristor connection points between the horizontal lines and the vertical lines, each vertical line and each horizontal line comprising at least one wire, the vertical lines being connected to one polarity of a DC source, each wire of each horizontal line being connected to the other polarity of said source via a protective device, each thyristor being controlled by trigger means, a protective device and trigger means of a thyristor connected to the horizontal line connected to said protective device being responsive to the presence of a mark signal and connecting said horizontal line to a vertical line, said protective device having connecting means for isolating the horizontal line to which it is connected in the absence of a mark signal and for bringing said horizontal line to a potential when a mark signal is applied to the protective device, said trigger means of the other thyristors connected to said horizontal line having their trigger voltage reduced by said potential of said horizontal line to a value that does not allow the firing of said thyristors, protective devices of the other horizontal lines and trigger means of the thyristor connected between said vertical line and the other horizontal lines being able to establish a connection with said horizontal line by said vertical line upon receipt of a mark signal.

4,190,744

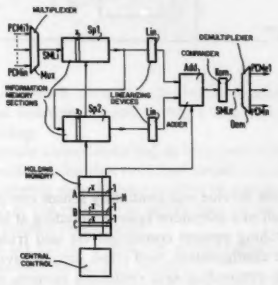
CIRCUIT ARRANGEMENT AND PROCESS FOR PRODUCING CONFERENCE CONNECTIONS BETWEEN THREE CONFERENCE PARTIES IN A PCM TIME MULTIPLEX SWITCHING SYSTEM

Richard J. Frank, Marlton, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,399

Int. Cl.[2] H04M *3/56*

U.S. Cl. 179—18 BC **9 Claims**



1. A process for establishing conference connections between first, second and third parties (A,B,C) in a pulse code modulation time multiplex switching system in which each of the parties (A,B,C) supplies a pulse code modulated code word, and in which in each case, sum code words (A+B,B+C,A+C) which are formed of pulse code modulated code words supplied by two of the parties are transmitted to the remaining party of the conference, comprising the steps of:

receiving the pulse code modulated words supplied by the conference parties (A,B,C);

writing the received pulse code modulated words into a memory cell of a first memory section during the respective time slots of the parties (A,B,C) in which such words occur;

during the writing into the first memory section, reading the pulse code modulated word already stored at that location to an adder as a first magnitude and writing the read pulse code modulated into a memory cell of a second memory section;

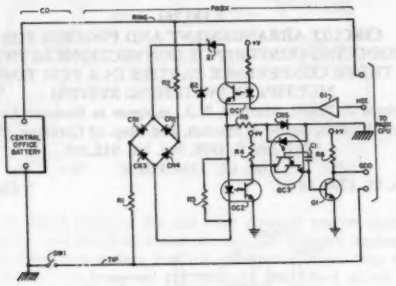
during writing into the second memory section, reading the pulse code modulated word already stored at that location to the adder as a second magnitude;

adding the first and second magnitudes to obtain the sum code words (A+B, B+C, A+C); and feeding the sum code words (A+B), (B+C), (A+C) to the respective conference parties (C),(A),(B) whose pulse code modulated word does not appear in the respective sum code words.

4,190,745
CALL FOR SERVICE AND CONTINUITY SENSOR CIRCUIT

Julius Jusinskas, Jr., Glen Ellyn, Ill.; David Q. Lee, Boca Raton, Fla., and Richard M. Rovnyak, Schaumburg, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 1, 1978, Ser. No. 965,713
Int. Cl.[2] H04M 7/14
U.S. Cl. 179—18 AH 10 Claims



1. A call for service and continuity sensor circuit for use in a trunk circuit of a telephone system including at least first and second switching centers connected via said trunk circuit in ground start configuration, said trunk circuit having first and second leads connecting said switching centers, said call for service and continuity sensor circuit comprising:

current direction means connected between said first and said second leads of said trunk circuit;

circuit switching means connected between said current direction means and said second switching center and including gating means connected to said second switching center and a first optical coupler device connected between said current direction means and said gating means, operated in response to an input signal from said second switching center to disable said call for service and continuity sensor circuit;

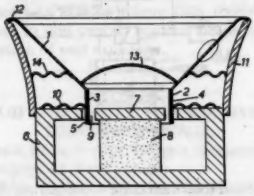
continuity detection means for detecting a non-continuous loop between said first and second switching centers, connected between said current direction means and said circuit switching means, said continuity detection means including a second optical coupler device connected between said current direction means and said first optical coupler device, operated in response to a non-continuous open loop circuit connection of said first lead at said first switching center to produce a first output signal; and

polarity detection means for detecting a negative potential on said second lead, representing a call for service, and connected between said continuity detection means and said second switching center, said polarity detection means operated in response to said negative potential to produce a second output signal representative of said negative potential and operated to combine said first and said second output signals to produce and to transmit a third output signal to said second switching center.

4,190,746
DIAPHRAGM MATERIAL FOR MOVING COIL LOUDSPEAKER, MAY BE LAMINATED OR INTEGRAL WITH SURROUND

Hugh D. Harwood, 84 Beechwood Rd., Sanderstead, Surrey; Joseph Y. C. Pao, "Mei-Lan", Coombe Park, Kingston-upon-Thames, and David W. Stebbings, 1 Downswood, Reigate, Surrey, England

Filed Mar. 18, 1977, Ser. No. 779,221
Claims priority, application United Kingdom, Mar. 19, 1976, 11057/76
Int. Cl.[2] H04R 7/12, 7/20, 9/02
U.S. Cl. 179—115.5 R 9 Claims

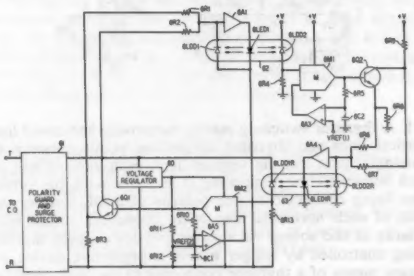


1. A diaphragm for a moving coil loudspeaker, the diaphragm being of conic section, of exponential section or having a cross-section over the major part thereof which is of conic section or of exponential section form, which diaphragm, in order to impart internal damping characteristics thereto, is formed of, or includes a layer of, a diaphragm-forming material selected from the group consisting of polypropylene, polyethylene and ethylene-propylene copolymers, the ethylene being present in copolymerized form in minor amount with respect to the propylene, said material having a mechanical "Q" value of from 7 to 12, a Young's modulus of from 8.5 to 17.5×10^5 KN/M^2 and a density of from 0.85 to 1.05 g/cc.

4,190,747
SIGNAL CORRECTED OPTOCOUPLED DEVICE

Alexander Feiner, Rumson; Chao Kai Liu, Matawan, and Sigurd G. Waaben, Princeton, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1978, Ser. No. 893,795
Int. Cl.[2] H04B 1/58, 9/00
U.S. Cl. 179—170 NC 5 Claims



1. A remote gain controlled optocoupled transmission circuit having an input terminal and an output terminal, said terminals separated by a photocoupled barrier, the input side of said barrier containing phototransmitting means operable for providing modulated phototransmission across said barrier in accordance with input transmission signals, and the output side of said barrier containing photodetecting means operable under control of received modulated phototransmission for

providing an output transmission signal linearly representative of said input transmission signal,

means for remotely establishing a reference DC voltage level, and

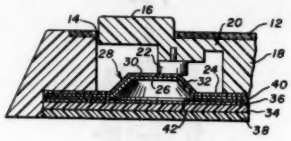
means for controlling the gain of said output transmission signal in accordance with the relative levels between any said established reference DC voltage and a DC voltage derived from said photodetecting means as a result of received phototransmission.

4,190,748

KEYBOARD SWITCH ASSEMBLY

Gordon B. Langford, Chandler, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jan. 31, 1977, Ser. No. 763,925
Int. Cl.[2] H01H *13/70*
U.S. Cl. 200—5 A 22 Claims



1. A keyboard assembly including:

hinged key means for delivering an input signal, said key means normally being in one position and being movable to a second position;

first insulating means spaced from said key means, said insulating means having first conductive means on a side thereof spaced from said key means;

flexible switch means projecting from said first insulating means toward said key means, said switch means having an inclined annular side surface extending to a flat top surface, at least part of said first conductive means being on the underside of said flat top surface;

second insulating means on the side of said first insulating means opposite to said key means, said second insulating means having second conductive means facing but out of contact with said first conductive means; and

securing means to fix the position of said first insulating means against lateral movement relative to said key means;

said key means contacting said flat top surface of said switch means at an off center location and causing said switch means to move with snap action from its normal state to an operated position to establish contact between said first conductive means on the underside of said flat top surface and second conductive means upon movement of said key means toward its second position, said switch means returning to its normal state upon return of said key means to its first position;

each of said switch means moving through a plane inclined to the plane of said first insulating means, said inclined plane extending in direction from approximately an intersection of said side surface and said first insulating means to a diametrically opposed intersection of said side surface and switch means top surface.

13. Flexible switch means including:

a sheet of flexible insulating material;

conductive patterning means on at least one side of said sheet of insulating material; and

an array of protrusions formed in and extending from the other side of said sheet of insulating material;

each of said protrusions having an inclined annular side surface extending to a flat top surface, each of said protrusion flat top surfaces normally being parallel to the plane of said sheet and having an area less than the base area of the protrusion as defined by the junction of said side surfaces and said sheet;

at least part of said conductive patterning means being on the underside of the flat top surface of each of said protrusions;

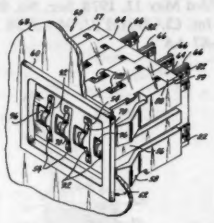
each of said protrusions being movable with snap action from the normal position thereof to a depressed operated position through a plane inclined at an angle to the plane of said sheet, said inclined plane extending in a direction from approximately an intersection of said side surface and said sheet to a diametrically opposed intersection of said side surface and protrusion top surface.

4,190,749

ROTARY THUMBWHEEL SWITCH ASSEMBLY

Richard W. Erickson, Glendora; James Pallaske, Covina, and Stephen B. Talbert, Pasadena, all of Calif., assignors to Becton, Dickinson Electronics Company, Pasadena, Calif.

Filed Jun. 27, 1977, Ser. No. 810,153
Int. Cl.[2] H01H *19/58*
U.S. Cl. 200—11 TW 28 Claims



6. A rotary switch assembly capable of assembly in fixed relation to an instrument panel having a front face and a rear face, comprising:

switch module means including at least one switch module, for providing selectable switched circuit connections, said switch module means being capable of insertion within an opening in the panel from either face of the panel, each switch module comprising:

a brush set having a plurality of electrically conductive and connected contact brushes,

circuit means for presenting multiple circuit combinations to contacts of the brush set,

a rotatable element adapted to be rotated about its center and comprising indicia means for visually presenting an indication of the rotary position of the rotary element, and including means for securing at least one said contact brush set, and

solid state integrated illuminating means positioned within said indicia means for illuminating the presented indicator; and

a bezel adapted for insertion through the opening in the panel from its front face for partially covering the switch module means, said bezel including a plurality of front face openings through which a rotatable element may protrude and through which said indicators may be presented, said bezel further including means for securing a predetermined number of switch module means to said bezel and to the panel.

17. A kit comprising at least two elements capable of assembly into a rotary switch assembly, the kit comprising:

a first element comprising at least one switch module having brush sets having a plurality of electrically conductive and connected contact brushes, circuit means for presenting multiple circuit combinations to contacts of each brush set, a rotatable wheel element adapted to be rotated about its center, said rotatable wheel element comprising indicator means for visually presenting an indication of the rotary orientation of said rotatable wheel element, said rotatable wheel element further comprising means for securing at least one said contact brush set, said switch

module further comprising a solid state integrated illuminating means positioned within said indicator presenting means for illuminating the presented indication; and

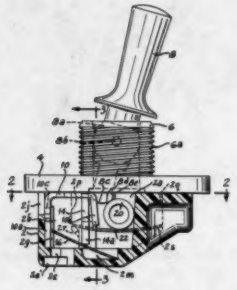
a second element comprising a bezel for receiving, by snap-in mounting, a plurality of said switch modules, said bezel including a plurality of front face openings through which actuating means for rotating said rotatable wheel element may protrude upon assembly, and through which said indication may be viewed after assembly, said bezel further including combining means for securing the bezel to the switch modules and means for securing the bezel to an instrument panel having an unfinished opening therethrough.

4,190,750

SNAP-ACTION SWITCH OF THE ROLLER CONTACT TYPE

Earl T. Piber, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 11, 1978, Ser. No. 905,286
Int. Cl.[2] H01H *21/04, 15/18, 1/16*
U.S. Cl. 200—67 AA **16 Claims**



1. A snap-action electric switch comprising:

an insulating housing having an open-top base closed by a cover providing a switch compartment with parallel side walls therein;

a pair of stationary contacts;

means for receiving said stationary contacts vertically down into said base for mounting in laterally spaced apart relation in said switch compartment;

a single-piece laterally-arranged elongated movable contact having ends complementary to said parallel side walls of said switch compartment whereby it is received vertically down into said base and guided for bridging said stationary contacts and having a curved surface whereby it is actuated;

an elongated leaf spring;

and means in said base for receiving said leaf spring vertically down thereinto to be supported at its ends above the bottom of said switch compartment for supporting and biasing said movable contact for movement into and out of bridging engagement with said stationary contacts;

actuator means movably mounted on said cover of said housing and comprising a double-incline apex movable over said curved surface of said movable contact while depressing said movable contact down against the force of said leaf spring to cause downward flexure of the latter to effect snap-action closure or opening of said movable contact with respect to said stationary contacts;

apertures in said housing located with respect to said stationary contacts;

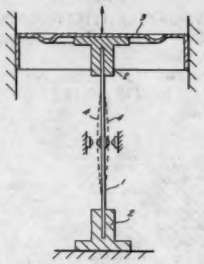
and connector means accommodated by said apertures for connecting said stationary contacts to an external circuit.

4,190,751

ELECTRICAL CONTACT SWITCH WITH AN EXTREMELY SMALL ACTUATING MOVEMENT

Jac M. Roth, and Veronika Roth nee Werner, both of Sandbuechel 26a, D-506 Bensberg-Refrath, Fed. Rep. of Germany

Filed Oct. 21, 1976, Ser. No. 734,639
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547257
Int. Cl.[2] H01H *5/20*
U.S. Cl. 200—67 DB **5 Claims**



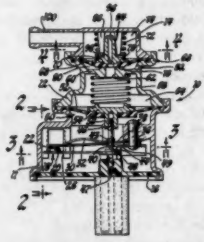
1. A movable leaf spring contact engageable with a fixed contact for switching the same, said leaf spring comprising a normally straight leaf spring body having two end portions and an intermediate portion therebetween; two rigid and laterally immovable anchors each rigidly embracing a different end portion of said spring so as to prevent all lateral movements of said end portions; and means connected to at least one of said anchors for directing through said one anchor and the respective end portion fastened thereto a compressive force which acts lengthwise of said spring body and towards the center of the same and for inducing a consequent transgression of bending stress of said intermediate portion of said leaf spring body which intermediate portion then suddenly bends and engages a fixed contact.

4,190,752

VACUUM ACTUATED SWITCH

David W. Rogers, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1978, Ser. No. 963,002
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—81.5 **4 Claims**



1. A vacuum actuated snap action switch comprising; a pair of electrical switch contacts, a snap action spring having two positions to engage and disengage said contacts, a variable level vacuum source, first and second vacuum motors connected to said vacuum source, fixed restriction means intermediate said first vacuum motor and said vacuum source, means connecting said first vacuum motor to said snap action spring for moving the same between its two positions to operate said switch in response to a change in the level of said vacuum

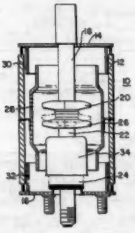
source between first and second vacuum levels, an atmospheric bleed orifice for said first vacuum motor, and valve means operated by said second vacuum motor responsive to variations in the level of said vacuum source above said second level for connecting and disconnecting said first vacuum motor and said atmospheric bleed orifice to shift the vacuum operating range of said first vacuum motor during variations in the level of said vacuum source above said second level.

4,190,753

HIGH-DENSITY HIGH-CONDUCTIVITY ELECTRICAL CONTACT MATERIAL FOR VACUUM INTERRUPTERS AND METHOD OF MANUFACTURE

Robert E. Gainer, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1978, Ser. No. 895,832
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



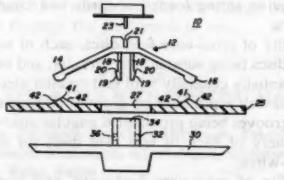
1. A vacuum interrupter contact which exhibits high electrical conductivity, and has a high density of greater than about 95% of the theoretical density, which contact is manufactured by the process consisting of admixing copper and chromium powder wherein the copper is present in an amount of greater than 65 wt.% and up to 90 wt.%, cold pressing the admixed powder to form a compact of high intermediate density, and vacuum-sintering the compact at a temperature below the melting point of the copper to achieve the density of greater than about 95%, without further hot densification.

4,190,754

SLIDE SWITCH ACTUATING APPARATUS

Joseph H. Kilar, Rolling Meadows, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1978, Ser. No. 962,271
Int. Cl.² H01H *3/02*
U.S. Cl. 200—329 **3 Claims**



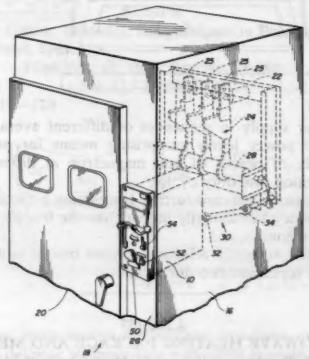
1. An improved slide switch actuating apparatus comprising:
a housing;
a slide switch device to be actuated located interior to said housing;
an elongated flexible retaining member engaging said slide switch device;
said retaining member having flexible hooking means extending towards the exterior of said housing;
said housing having a slot formed therein; and
a button member positioned exterior to said housing in overlying relation with said slot and having a socket portion to receive said hooking means in a snap fit;
wherein said housing includes at least one boss portion formed by inclined surfaces positioned on the interior thereof adjacent to said slot to contact said retaining member upon sliding movement thereof;
wherein said retaining member includes a plurality of flexible arm members each said arm member contacting said inclined surfaces during relative movement therebetween to effect a detent action in the operation thereof.

4,190,755

SWITCH OPERATOR UNCOUPLING MECHANISM

Edward J. Rogers, Chicago, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed May 31, 1978, Ser. No. 911,124
Int. Cl.² H01H *9/20*
U.S. Cl. 200—334 **8 Claims**



1. An improved mechanism for operating a switch comprising:
switch operating means having an output shaft, said switch operating means being operable to cause the output shaft to rotate through a predetermined rotation in first and second directions;
mounting means for demountably supporting said switch operating means in a coupled position;
switch drive linkage means operably connected to the switch to be operated; and
coupling means for engaging said switch drive linkage means with the output shaft of said switch operating means and thereby causing said switch drive linkage means to rotate conjointly with the output shaft to operate the switch when said switch operating means is inserted into the coupled position in said mounting means, said coupling means disengaging said switch drive linkage means from the output shaft of said switch operating means when said switch operating means is withdrawn from the coupled position.

4,190,756

DIGITALLY PROGRAMMED MICROWAVE COOKER

Richard A. Foerstner, Iowa City, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Continuation of Ser. No. 671,468, Mar. 29, 1976, abandoned.
This application Jan. 26, 1978, Ser. No. 872,531
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 B **6 Claims**

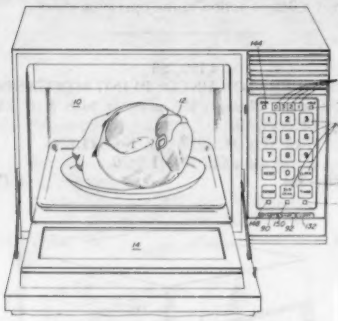
1. A microwave heating system comprising:
means comprising a magnetron for supplying microwave

energy to a multimode cavity having a movable closure member;

a power supply for said magnetron;

means for supplying power to said power supply from an alternating current source comprising a switch mechanically actuated by closure of said movable closure member;

means comprising a semiconductor switch connected in series with said mechanically actuated switch for controlling the supply of power to said magentron from said



power supply in sequences of different average microwave power levels comprising means for pulsing the supply of power to said magnetron at different pulse repetition rate duty cycles;

said controlling means further comprising a clock having a frequency substantially higher than the frequency of said power source; and

means for manually selecting at least one of said different pulse repetition rate duty cycles.

4,190,757

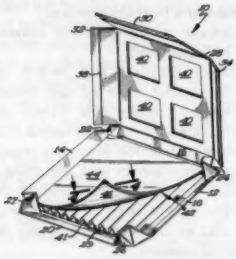
MICROWAVE HEATING PACKAGE AND METHOD

Charles H. Turpin, and Thomas C. Hoese, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 730,873, Oct. 8, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,906

Int. Cl.[2] H05B *9/06;* **B65B** *25/22*

U.S. Cl. 219—10.55 E **12 Claims**



1. A food heating package adapted to contain a food product comprising a package body formed from microwave transparent non-lossy dielectric sheet material having a cellulosic or plastic resinous base defining a container body and a lossy microwave absorptive heating body connected to the package and associated in heat conductive relationship with said food, said heating body being in sheet form and the thickness of said sheet being at least about 0.016 inch thick and being substantially within the range wherein the sheet thickness and the temperature response during microwave heating are positively correlated, said sheet being of the minimum thickness that will reach but not exceed a preselected equilibrium operating temperature, a metal sheet in overlying relation to one side of and adjacent to the heating body, said heating body being characterized by heating when exposed to microwave radiation within a microwave oven to a sufficient temperature to sear, brown or crisp the food and cooling in 30 seconds or less after the oven is turned off to the temperature of the food whereby the package can be used as a dish from which the food can be directly eaten without burning the fingers.

4,190,758

GRID WELDING MACHINE

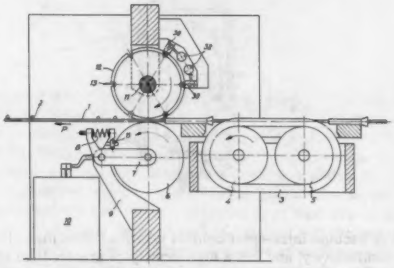
Hans Gött; Gerhard Ritter; Klaus Ritter, and Josef Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH., Steiermark, Austria

Filed Mar. 24, 1978, Ser. No. 889,747

Claims priority, application Austria, Apr. 18, 1977, 2699/77

Int. Cl.[2] B23K *11/06*

U.S. Cl. 219—56 **9 Claims**



1. A machine for welding grids of longitudinal and cross-wires, comprising in combination:

means for feeding said longitudinal wires continuously through said machine;

means defining a feed-path for the longitudinal wires, and a feed-course for the cross-wires substantially transverse thereto;

a plurality of rotary electrodes disposed on one side of said feed-path for the longitudinal wires,

an equal plurality of counter electrodes arranged on the other side of said feed-path, both said electrodes and said counter electrodes comprising rollers, each of said counter electrode rollers being disposed substantially coplanar with a respective electrode roller, and on the opposite side of the feed-path thereof, said electrode rollers being spring loaded towards said counter-electrode rollers;

a plurality of cross-wire feed-discs, each of said cross-wire feed discs being substantially circular, and being mounted substantially coaxially with said counter electrode rollers, and having a plurality of grooves passing therethrough, said grooves being provided at angular intervals along the periphery of each of said feed discs for receiving said cross-wires;

a plurality of cross-wire feed-ways, said cross-wire feed-ways being disposed radially outside said cross-wire feed-discs at angular intervals corresponding to the angular intervals of said grooves in said cross-wire feed-discs;

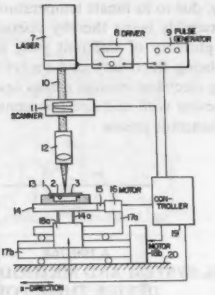
means associated with said cross-wire feed-ways for simultaneously feeding said cross-wires radially inwardly into said grooves and

a driving shaft having said cross-wire feed-discs secured thereto for rotation therewith, said counter electrode rollers being mounted on, and rotatable relative to said driving shaft.

4,190,759
PROCESSING OF PHOTOMASK

Mikio Hongo, and Junichi Nakabayashi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 717,375, Aug. 24, 1976, abandoned.
This application Jul. 6, 1978, Ser. No. 922,369
Claims priority, application Japan, Aug. 27, 1975, 50-103031
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 LM 8 Claims



1. A method of removing and correcting remaining defects in a photomask comprising the steps of:

(a) preparing a photomask comprising a transparent glass substrate, a desired circuit pattern of a thin metal film deposited on one surface thereof and having at least one defective portion of the thin metal film existing on said substrate apart from said circuit pattern after forming said circuit pattern:

(b) positioning the defective portion of the photomask in a scanning area of a pulsed laser beam;

(c) irradiating a pulsed laser beam onto an inner surface of the defective portion of the thin metal film which contacts said substrate through the transparent glass substrate, said laser beam being focussed to provide a beam spot not greater than 5 μm in diameter;

(d) relatively scanning the pulsed laser beam with respect to said photomask in two-dimensional directions so as to scan over said defective portion of the photomask;

(e) controlling the oscillation frequency of the pulsed laser beam as well as the scanning speed of the laser beam on the defective portion of the thin metal film, and providing beam spots of said laser beam partially superimposed with a super position number in the range of from 1.2 to 15; and

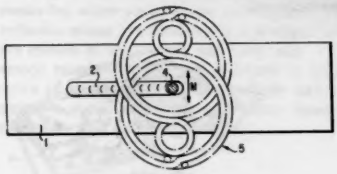
(f) removing the defective portion of the thin film while maintaining roughness and pit depths of the processed surface portion underlying the removed thin film portion to less than λ/4, where λ is the wavelength of light for exposure through the photomask in use.

4,190,760
WELDING APPARATUS WITH SHIFTING MAGNETIC FIELD

Motomi Kano, Fujisawa; Keiichiro Hirakoso, Tokyo, and Katsuhiko Nomura, Kamakura, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 16, 1977, Ser. No. 797,630
Claims priority, application Japan, May 14, 1976, 51/56233; Oct. 28, 1976, 51/130117
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—128 5 Claims

1. A welding apparatus for controlling shapes of molten metal pools, which comprises means for supplying heat energy for welding, means for moving said energy supplying means relatively to a base metal to be welded, means for generating in the vicinity of a molten metal pool a magnetic field making a periodical electromagnetic change and means for moving said magnetic field generating means relatively to the base metal wherein said means for generating a magnetic field includes a

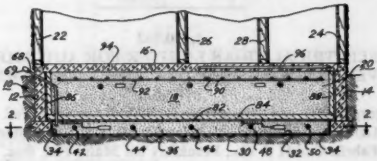


pair of driving coils and said driving coils are disposed so that their centers are staggered from each other by a distance corresponding to the radius of at least one of said driving coils.

4,190,761
HEAT LOSS CONTROL SYSTEM FOR BUILDING HEAT SUMPS

Jerrold L. Colten, Lakeville, Ind., assignor to Bristol Products Inc., Bristol, Ind.

Filed Feb. 28, 1979, Ser. No. 16,286
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—213 12 Claims



1. A heat sump system for building structures, comprising side walls defining an inner area with earth beneath said area, heat absorbing and releasing fill material in said space, an insulating layer of porous material disposed between said fill material and the earth, means for removing moisture from said layer and maintaining said layer in an effective heat insulating condition, layer means substantially impervious to water separating said fill material from said insulating layer, a floor above said fill material, and an electrical heating means for heating said fill material.

4,190,762
ADJUSTABLE GAP ELECTRODE ARRANGEMENT FOR ELECTROLYTICALLY HEATED STEAM IRON

Romeo S. Santiago, San Marino, and Llewellyn Decker, Upland, both of Calif., assignors to General Electric Company, New York, N.Y.

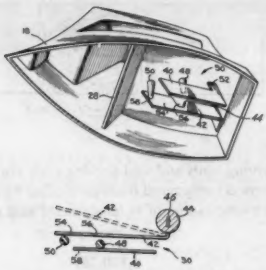
Filed Jul. 17, 1978, Ser. No. 924,911
Int. Cl.[2] H05B 3/60; D06F 75/16; F22B 1/30
U.S. Cl. 219—245 7 Claims

1. In a lightweight electrolytic steam iron having a handle and a soleplate with steam distributing means for distributing steam therefrom, a casing of electrically non-conducting material forming the walls of an internal water tank coextensive with and over the soleplate, spaced electrodes supported within said tank for immersion in the water therein for generating steam from the water, and insulated steam conduit extending from the soleplate upwardly into said tank for directing saturated steam from said tank to said steam distributing means, the improvement wherein the spaced electrodes comprise,

a pair of adjacent parallel electrode plates disposed in said tank and spaced from the tank walls and each other, said plates being movable relative to each other to adjust the spacing therebetween,

means connected with said plates for selectively adjusting the spacing between said plates from the iron handle,

separate spaced stop means on said tank walls limiting movement of each plate toward the other to avoid contact therebetween,



one of said plates being shorter than the other so that an extension is defined on said other plate for contacting said stop means limiting the other plate movement, and

a cut-out notch on said other plate opposite the stop means of said shorter plate preventing arcing from mineral deposits on said stop means of said shorter plate.

4,190,763

ELECTRICAL CIGAR LIGHTER FOR AUTOMOTIVE VEHICLE WITH SNAP DISC BIMETALLIC SWITCH MEANS

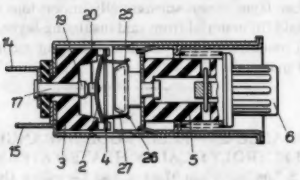
Georg Seibel, and Günther Mues, both of Dreieich, Fed. Rep. of Germany, assignors to Schoeller & Co. Elektrotechnische Fabrik GmbH & Co., Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,798

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652857

Int. Cl.² F23G 7/02

U.S. Cl. 219—265 **6 Claims**



1. An electrical assembly for motor vehicles primarily adapted for use as a lighter for tobacco articles, comprising: a socket assembly; electrical circuit means having a contact member extending to within said socket assembly and including a source of electrical energy to effect energization of an electrical element placed in circuit therewith; a plug assembly adapted to be connected with said electrical circuit means thereby to effect electrical energization of an electrical element, said plug assembly including plug electrical contact means adapted to effect an electrical connection within said socket assembly; electrical connector means fixedly mounted within said socket assembly including first interconnection means adapted to have said plug electrical contact means placed into and out of electrical contact therewith and second interconnection means adapted to be electrically interconnected with said electrical circuit means; a bimetallic switching element shaped in the form of a disc and operating to snap between an ambient-temperature position and an elevated-temperature position in response to temperature levels within said socket assembly; and mounting means operatively maintaining said switching element within said socket assembly between said contact member of said electrical circuit means and said second interconnection means of said electrical connector means, said switching element being thereby mounted to make and break electrical interconnection between said contact member and said second interconnection means solely by means of said switching element snapping to said ambient-temperature position and to said elevated-temperature position, respectively, due to its innate temperature responsiveness; said electrical assembly being thereby operative to energize individually a plurality of different plug assemblies which are capable of being fitted into said socket assembly and which include plug electrical contact means operative to effect electrical connection with said first interconnection means of said electrical connector means.

4,190,764

CONTROL SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR

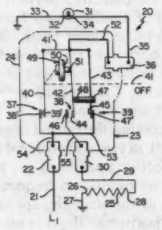
Cloyd E. Decker, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 795,403, May 9, 1977, Pat. No. 4,110,601, which is a continuation of Ser. No. 550,456, Feb. 18, 1975, abandoned. This application Dec. 1, 1977, Ser. No. 856,353

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.² H05B 1/02

U.S. Cl. 219—506 **15 Claims**

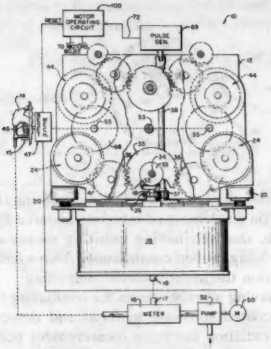


1. A control system comprising a source of energy means, heater means, indicator means, and thermostatically operated control means having selector means for setting said control means in a heater means non-temperature producing "off" setting or in a heater means temperature producing "on" setting, said control means having a single temperature responsive device operatively interconnected to said means to interconnect said heater means to said energy means when the output temperature effect of said heater means is below a predetermined "on" setting of said control means and to disconnect said heater means from said energy means when the output temperature effect of said heater means is above said predetermined "on" setting of said control means, said single temperature responsive device of said control means operating said indicating means to indicate that the output temperature effect of said heater means is above a certain value only when said control means is in said "off" setting thereof, said control means having switch means continuously operating said indicating means independently of said temperature responsive device and regardless of the output temperature effect of said heater means to indicate that said selector means is set in said "on" setting thereof only when said selector means is set in said "on" setting thereof.

4,190,765
COUNTER OPERATING SYSTEM

Donald W. Fleischer, Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Division of Ser. No. 832,553, Sep. 12, 1977, Pat. No. 4,127,767, which is a continuation-in-part of Ser. No. 772,943, Feb. 28, 1977, Pat. No. 4,132,887. This application May 30, 1978, Ser. No. 910,688
Int. Cl.[2] G06M *1/04*
U.S. Cl. 235—92 C 5 Claims

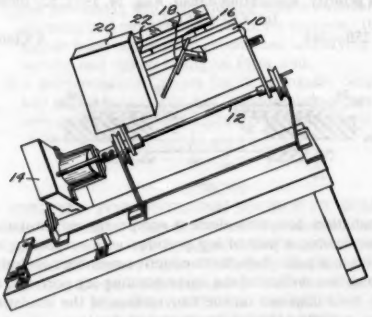


1. A method of angularly indexing a rotary counting register having at least one rotary register wheel, at a variable register counting rate to register an incoming count having a variable incoming counting rate, with an electrical stepping motor electrically operable in individual steps at a variable stepping rate for indexing the rotary register at a variable register counting rate, the method of angularly indexing the rotary register comprising the steps of accumulating an incoming count at a variable incoming counting rate and electrically operating the stepping motor at a variable stepping rate so that the registered count of the rotary register lags said accumulated count by a variable plurality of individual steps of the motor which varies generally proportionally with one of said variable rates.

4,190,766
SUN TRACKING SYSTEM

Danny J. Young, Tyler, Tex., assignor to James W. Fair, Tyler, Tex.

Filed Aug. 22, 1977, Ser. No. 826,833
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R 30 Claims



15. A sun tracking system for aligning a body with the sun comprising:

reflector means for reflecting sunlight to illuminate a discrete area disposed along a path, the position of said illuminated area along said path being indicative of the alignment of said reflector means with the sun, said reflector means being fixedly disposed with respect to said body;

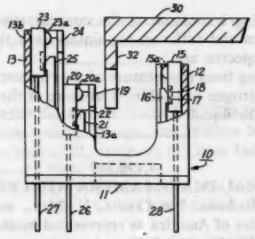
motor means for, when not inhibited, rotating said body, and said reflector means in a direction in accordance with the relative motion of the sun and said body; and

photo-sensor means, disposed on said path at a position indicative of alignment between said body and sun, for generating a signal to inhibit said motor means when illuminated by said reflected sunlight.

4,190,767
OPTICAL ENCODER APPARATUS

Ronald J. Crouse, McKinney, Tex., assignor to TRW Inc., Los Angeles, Calif.

Filed Jun. 26, 1978, Ser. No. 919,394
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE 7 Claims



1. Encoder apparatus comprising

(a) a radiant energy source,

(b) first and second radiant energy sensors responsive to the radiant energy emitted by said radiant energy source, and

(c) mounting means for supporting said sensors in spaced relation with said radiant energy source, said mounting means comprising

(i) a base member with substantially parallel first and second hollow spaced apart leg members extending therefrom in the same direction,

(ii) means for supporting said radiant energy source within said first leg member to direct radiant energy toward said second leg member.

(iii) first and second optical apertures in said second leg member opposite said first leg member, and

(iv) means for supporting said first and second radiant energy sensors within said second leg member substantially opposite said radiant energy source whereby radiant energy emitted by said radiant energy source may pass through said first and second optical apertures and strike said first and second radiant energy sensors, respectively.

4,190,768
DETERMINING THE WATER CUT AND WATER SALINITY IN AN OIL-WATER FLOW STREAM BY MEASURING THE SULFUR CONTENT OF THE PRODUCED OIL

Dan M. Arnold, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

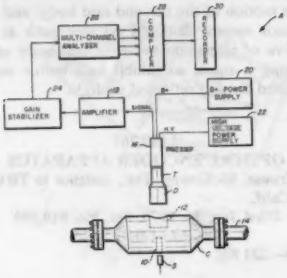
Filed Jun. 29, 1978, Ser. No. 920,569
Int. Cl.[2] G01V *5/00*; G01N *23/00*
U.S. Cl. 250—270 26 Claims

1. A method for analysis of a liquid flowstream, containing oil and water and flowing in a conduit, to determine the water cut of the liquid, comprising the steps of:

(a) bombarding the liquid with fast neutrons which are

slowed down and thereafter engage in thermal neutron capture reactions with materials in the liquid:

(b) obtaining gamma ray energy spectra of the materials in response to the capture of thermal neutrons by the materials in the liquid;



(c) obtaining a measure of the concentration of chlorine, hydrogen and sulfur in the liquid from the gamma ray energy spectra; and

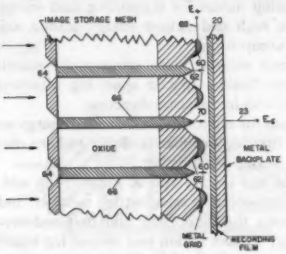
(d) obtaining from the measure of the concentration of chlorine, hydrogen and sulfur, a measure of the water and oil cuts of the liquid.

4,190,769

THERMAL IMAGE CAMERA WITH STORAGE

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 7, 1978, Ser. No. 913,412
Int. Cl.[2] H01J *31/49*
U.S. Cl. 250—332 **14 Claims**



1. In a thermal image camera comprising an area detecting cathode having a front and a back face, means for focusing thermal images on said front face, means for generating and guiding a coherent thermal signal to illuminate said front face, means for generating an electron image at said back face, and means for focusing said electron image, the improvement comprising:

(a) means within said area cathode for converting the different frequencies between the thermal image and the coherent thermal signal to said back face electron image,

(b) storage means in said camera receiving and storing said electron from said back face,

(c) first focusing means for focusing said electron image on said storage means,

(d) means for transferring said electron image from said back face to said storage means,

(e) viewing means for said electron image,

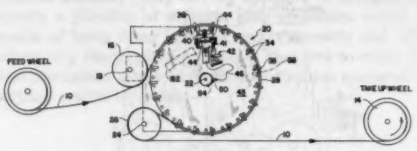
(f) second focusing means for said electron image emitted by said storage means onto said viewing means.

4,190,770

BACKSCATTER INSTRUMENT HAVING INDEXING FEATURE FOR MEASURING COATING THICKNESS OF ELEMENTS ON A CONTINUOUSLY MOVING WEB OF SUBSTRATE MATERIAL

James Saunders, Pleasantville; William D. Hay, Peekskill; Jacques Weinstock, Flushing, and Derek Lieber, North Merrick, all of N.Y., assignors to Unit Process Assemblies, Inc., Syosset, N.Y.

Filed Nov. 15, 1977, Ser. No. 851,735
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—308 **9 Claims**



1. In a backscatter measuring device for measuring the thickness of a coating on an element of substrate material forming a portion of a web, the web having indexing means along an edge thereof and being moved continuously from a feed supply to a take-up location the improvement comprising:

a probe head having a probe means for irradiating the coating on the coated substrate material and detecting the backscatter radiation during a measurement period and having locating means for engaging the indexing means;

the probe means and the locating means being positioned on the probe head in the same relation as the element to be measured and the indexing means are positioned on the web;

a probe holding assembly for holding the probe head in adjacent relation with the web during the measurement period and being mounted to move the probe head along the longitudinal axis of the web;

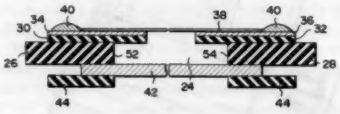
means for causing the probe holding assembly to move the probe head along the longitudinal axis of the web just prior to the measurement period until the locating means engages the indexing means whereby the probe means is properly aligned with the coated element to be measured.

4,190,771

RADIATION DETECTION ELEMENT

Hisashi Kamei, Tokyo; Shimpey Shirayama, Yokohama; Tsuneo Nakakita, Kawasaki; Moriyoshi Murata, and Yushichi Kikuchi, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 23, 1978, Ser. No. 936,085
Claims priority, application Japan, Aug. 24, 1977, 52/100605
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—385 **8 Claims**



1. A radiation detection element comprising an insulating base frame having a pair of leg portions with a spacing left therebetween; a pair of electroconductive members each disposed along one surface of the corresponding leg portions; an electrode plate disposed on the rear surface of the insulating base frame to cover the spacing between the leg portions; a plurality of signal electrode wires disposed between the electroconductive members such that they confront the electrode plate; and an insulating member disposed at least between the

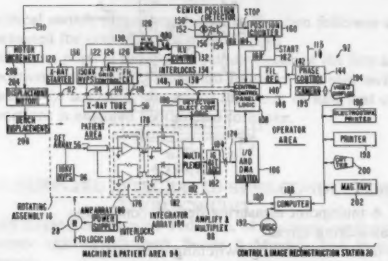
insulating base frame and the electroconductive member or between the insulating base plate and the electrode plate and having its longitudinal edge portion overhung beyond the inner wall surface of the insulating base frame into the spacing between the leg portions of the base frame.

4,190,772

TOMOGRAPHIC SCANNING APPARATUS HAVING DETECTOR SIGNAL DIGITIZING MEANS MOUNTED TO ROTATE WITH DETECTORS

Kendall L. Dinwiddie, Palo Alto; Robert G. Friday, Portola Valley; Janos A. Racz, San Jose, and Edward J. Seppi, Menlo Park, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 19, 1976, Ser. No. 677,958
Int. Cl.[2] A61B *6/00*
U.S. Cl. 250—445 T **13 Claims**



1. Apparatus for examining a bodily portion of a human being by means of penetrating radiation and providing a digital output signal for use in reconstruction of a two-dimensional representation of the bodily structure residing in a thin section taken through said body portion; said apparatus comprising:

an assembly rotatable about an axis extending along a central opening defined therein;

means for positioning the portion of said body to be examined within said central opening, whereby said axis of assembly rotation is substantially perpendicular to said section;

a source of penetrating radiation being mounted on said assembly toward one side thereof and providing radiation in the form of a fan beam;

detector means for said radiation positioned on said assembly opposite said source for detecting radiation progressing laterally across said section and not absorbed by said body portion;

means for rotating said assembly whereby said fan beam impinges upon said body portion at a plurality of incident directions;

signal processing and conditioning means mounted on said assembly and movable therewith, for receiving the output signals from said detector means and amplifying and converting said signals to digital form; and

first interconnection means for receiving the outputs from said signal processing and conditioning means and enabling interfeed of said digitalized output signals to a data receiving station.

4,190,773

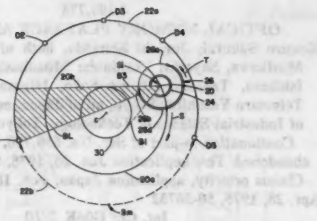
SHUTTER FOR ROTATING SOURCE CT SCANNER

Arthur B. Braden, 6263 Gatewood Dr., Mentor, Ohio 44060; John J. Kuwik, 411 E. 322nd St., Willowick, Ohio 44094; Samuel K. Taylor, Taylor Wells Rd., Chardon, Ohio 44024, and John Covic, 1581 Mapledale, Wickliffe, Ohio 44092

Filed Jul. 1, 1977, Ser. No. 812,317
Int. Cl.[2] A61B *6/02*; G01N *23/08*
U.S. Cl. 250—445 T **51 Claims**

41. A radiation aperture system for a CT scanner having a rotating source of radiation and a detector array including a series of stationary radiation detectors at least partially encircling the path of the source in the same plane, comprising:

a radiation blocking body having at least one radiation passing aperture mounted for rotation about the source; and



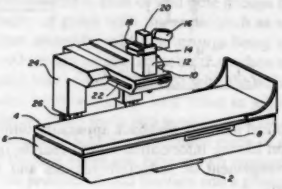
drive means for causing counter-rotation of said body about the source as the source rotates.

4,190,774

RADIOGRAPHIC TABLE SYSTEM

Cedomir S. Marinkovich, Chicago, and William M. Crimmins, Vernon Hills, both of Ill., assignors to Litton Industrial Products Inc., Beverly Hills, Calif.

Filed Mar. 9, 1978, Ser. No. 884,906
Int. Cl.[2] A61B *6/04*
U.S. Cl. 250—446 **14 Claims**



1. In a radiographic system of the type typically including a table for supporting the radiographed subject,

means for producing and directing radiographic beams to the area of the subject to be radiographed,

beam receiving means for producing and displaying the radiographic image of the radiographed area,

means for supporting the beam-directing means and beam-receiving means on opposite sides of the table,

means for moving the beam-directing and beam-receiving means in alignment in generally transverse and longitudinal directions, and

means for moving at least one of the beam-directing and beam-receiving means generally vertically while generally maintaining their alignment

the improvement comprising:

first carriage means mounted within the table body for generally longitudinal movement and adapted to support one of the beam-directing means and beam-receiving means as the lower beam means, the first carriage means including first guide means for permitting generally transverse movement of the lower beam means;

a generally vertically extending support member coupled to the first carriage means for longitudinal movement therewith and extending outward from the table;

second carriage means mounted for guided generally vertical movement and adapted to support a housing contain-

ing the other of the beam-directing and beam-receiving means in alignment with the lower beam means and including second guide means for permitting generally transverse movement of said housing and

means for synchronizing the transverse movement of the beam-directing and beam-receiving means.

4,190,775

OPTICAL MEMORY PLAYBACK APPARATUS

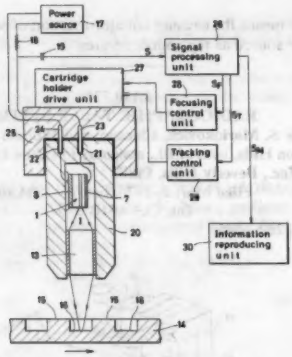
Kenjiro Sakurai; Junichi Shimada, both of Tokyo; Takitaro Morikawa, Sayama; Yoshinobu Mitsuhashi, Tokyo; Satoshi Ishihara, Tanashi; Atsuya Seko, Higashi-Murayama, and Tetsutaro Yasuhira, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 658,770, Feb. 17, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 919,275

Claims priority, application Japan, Feb. 18, 1975, 50-19472; Apr. 28, 1975, 50-50732

Int. Cl.[2] **G06K** *7/10*

U.S. Cl. 250—570 **3 Claims**



1. An optical memory playback apparatus, which comprises:

a medium having information stored therein in the form of an arrangement of reflective regions and nonreflective regions,

an electroluminescent semiconductor element adapted to emit a light through one end surface thereof for reading out the information from the medium,

a rod lens serving to lead the light emitted from the electroluminescent semiconductor element onto the medium and return the light reflected from the medium to the end surface of the electroluminescent semiconductor element,

a cartridge having the electroluminescent semiconductor element and the rod lens incorporated therein with their optical axes coinciding with each other, a cartridge holder drive means having the cartridge held in a state freely movable in the lateral direction and the perpendicular direction with respect to the medium,

a signal processing unit serving to detect the change of terminal voltage of the electroluminescent semiconductor element due to the self-coupling effect brought about by the returned light from the medium,

an information reproduction means for reproducing the information in accordance with the signal received from the signal processing unit,

a focusing control means serving to issue a signal to the cartridge holder drive means in accordance with the signal from the signal processing unit for thereby controlling the focal point of the light being sent to the medium, and

a tracking control means serving to issue a signal to the cartridge holder drive means in accordance with the signal from the signal processing unit for thereby controlling the tracking of the light being sent to the medium.

4,190,776

MULTIPOINT MEASURING DEVICE

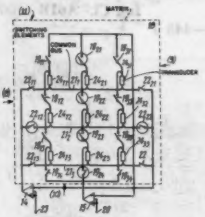
Boris P. Podboronov, ulitsa Molodezhnaya, 30, kv. 50, Zhukovsky Moskovskoi oblasti; Sergei S. Sokolov, ulitsa Vavilova, 513, kv. 137, Leningrad, and Anatoly V. Furman, ulitsa Chkalova, 21, kv. 6, Zhukovsky Moskovskoi oblasti, all of U.S.S.R.

Filed Jan. 11, 1978, Ser. No. 868,630

Claims priority, application U.S.S.R., Jan. 18, 1977, 2443394

Int. Cl.[2] **H01H** *0/00*

U.S. Cl. 307—112 **1 Claim**



1. A multipoint measuring device, comprising

a measuring circuit;

switch means having switching elements;

a plurality of transducers, each converting the measurand to an electric signal and each having two terminals, said transducers forming, in conjunction with said switching elements, a matrix having columns formed by said switching elements connected in series, and rows, each of said rows comprising a common bus, each of said buses having a beginning and a spaced opposite end and having connected thereto one of said switching elements at the beginning and one of said switching elements at the end, each of said transducers having one of the terminals thereof connected to a respective switching element forming the corresponding column of the matrix and the other terminal thereof connected to the common bus of a respective row of said matrix;

a first compensator for the rows of said matrix; and

a second compensator for the columns of said matrix, said compensators compensating for the resistances of the connecting lines of said transducers and the intrinsic resistances of said switching elements, said compensators connecting said matrix to said measuring circuit so that both rows and columns of said matrix are connected in parallel with said compensators.

4,190,777

POSITION SENSOR FOR ROTATABLE LAMP CHANGER TURRET

Dan G. Luce; William R. Klein, both of Houston, and Richard D. Krenke, Katy, all of Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Aug. 2, 1978, Ser. No. 930,308

Int. Cl.[2] **H01H** *3/00;* **H05B** *39/10*

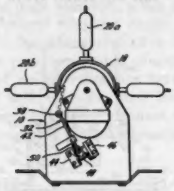
U.S. Cl. 307—139 **2 Claims**

1. A position sensor for a rotatable lamp changer turret having having a plurality of lamps which are controllably rotated by a motor in sequence to an operating position as circuit means senses when at least one of the lamps burn out comprising,

a circular cam positioned on the turret, said cam including first position indicating portion for each of the lamps for indicating when each of the lamps is in the operating position,

said cam including a second position indicating portion for indicating that all of the lamps have been rotated past the operating position,

a cam follower engaging said cam and actuated by said first and second position indicating portions as the turret rotates,



electrical switch means connected to the cam follower and actuated for controlling the motor, and

a third cam portion positioned between each of the first cam portions for actuating said cam follower and said switch means for actuating the motor until one of said first cam portions is engaged by the cam follower.

4,190,778

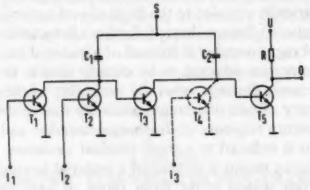
A.C. SUPPLIED INTEGRATED SEMI-CONDUCTOR LOGIC CIRCUIT

Gerhard Krause, Rosenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 647,856, Jan. 9, 1976. This application Jun. 12, 1978, Ser. No. 914,842

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—254 **1 Claim**



1. A circuit arrangement comprising:

first, second, third and fourth transistors each including a base, an emitter and a collector,

said emitters connected to a common reference potential,

said bases of said first and second transistors adapted to receive d.c. logic control signals,

said base of said third transistor connected to said collectors of said first and second transistors,

said base of said fourth transistor connected to said collector of said third transistor,

a resistor,

said collector of said fourth transistor serving as an a.c. and d.c. output and connected to a d.c. supply potential via said resistor, and

a.c. supply means adapted to receive a high frequency a.c. signal, said supply means connected to said collectors of said first, second and third transistors,

blocking of said first and second transistors by said control signals causing conduction of said third transistor to shunt the a.c. signal from said fourth transistor to maintain it blocked and provide a d.c. output via the d.c. supply and said resistor,

conduction of either of said first and second transistors shunting the a.c. signal from said third transistor causing conduction of said fourth transistor at the frequency of the a.c. signal to provide a d.c. and a.c. output.

4,190,779

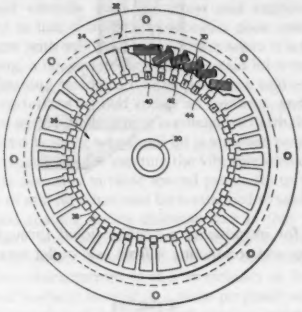
STEP MOTORS

Ernest Schaeffer, 6234 Kent Land Ave., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 683,180, May 4, 1976, abandoned. This application May 23, 1977, Ser. No. 799,302

Int. Cl.[2] H02K *41/02*

U.S. Cl. 310—12 **31 Claims**



1. A motor for encouraging relative motion between a rotor assembly and a stator assembly comprising:

a rotor assembly presenting at a rotor surface a plurality of rotor poles equally spaced at a predetermined pitch, each said pole having the opposite polarity of the immediately adjacent rotor poles;

a stator assembly presenting a plurality of pole groups adjacent said rotor surface, each of said pole groups having an equal plurality of poles with the same pitch as said poles on said rotor assembly, said pole groups being staggered adjacent said surface of said rotor so that when said poles in any of said pole groups is aligned with the adjacent said poles of said rotor assembly, said poles in adjacent said pole groups are offset from said poles on said rotor assembly by a fraction of said predetermined pitch of said rotor poles, said fraction being any ratio of two unequal integers such that the product of said fraction and a predetermined number of said pole groups is an integer, whereby said pole groups are equally spaced adjacent said rotor surface; and

means for controllably polarizing said plurality of poles in any of said plurality of pole groups so that adjacent poles in the respective said pole groups have different polarity.

4,190,780

LIQUID COOLED DISC MACHINES

Eric Whiteley, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Nov. 21, 1977, Ser. No. 853,180

Claims priority, application Canada, Dec. 30, 1976, 268889

Int. Cl.[2] H02K *5/20*

U.S. Cl. 310—59 **10 Claims**

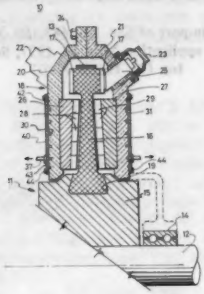
1. A cooling system for an axial air gap dynamoelectric machine having a discoidal rotor and at least one stator, comprising

a plate having one surface conforming to an exterior portion of surface of said stator,

a groove in said exterior portion of surface of said stator forming a passageway when said plate is in engagement with said stator,

means for removably securing said plate to said stator whereby removal of said plate exposes said groove for cleaning,

inlet and outlet means communicating with said passageway, and



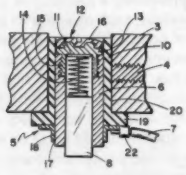
means for introducing a cooling liquid through said inlet means and conducting it from said outlet means.

4,190,781

BRUSH SYSTEM FOR A PORTABLE ELECTRIC TOOL

William D. Sauerwein, Joppa, and Richard E. Walton, II, Fallston, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 24, 1977, Ser. No. 827,144
Int. Cl.[2] H02K *39/38*
U.S. Cl. 310—239 5 Claims



1. In a brush system for a portable electric tool equipped with a metal motor housing and an electric motor mounted in the housing, the brush system including:

an annular insulating body mounted in the motor housing;

a conductive tubular sleeve mounted in said body so as to cause an end portion of said sleeve to protrude out from one end of said body;

a carbon brush for contacting the commutator of the electric motor, said carbon brush being slideably disposed in and electrically connected to said tubular sleeve;

resilient biasing means for resiliently biasing said carbon brush to extend beyond said sleeve and to resiliently hold said carbon brush against the commutator; and wherein the improvement according to the invention comprises:

a terminal for holding an electric lead, said terminal being made of ductile material having substantially the characteristics of half-hard brass and including an uninterrupted annular portion said annular portion being press-fitted onto and completely surrounding said protruding end portion of said sleeve; and,

the inner diameter of said annular portion and the outer diameter of said end portion being selected so as to cause said annular portion to be stressed into the plastic range of said material when the annular portion is press-fitted onto said end portion of said sleeve;

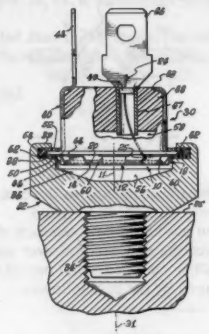
said annular portion defining a smooth cylindrical inner wall in press-fitting engagement with said protruding end portion of said sleeve.

4,190,782

PIEZOELECTRIC CERAMIC RESONANT TRANSDUCER WITH STABLE FREQUENCY

Joe F. Guess, Cedar Rapids, Iowa, assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Jul. 24, 1978, Ser. No. 927,546
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—324 2 Claims



1. Temperature compensated piezoelectric transducer including a diaphragm member having a peripheral mounting portion and a central sensing portion, a circular piezoelectric ceramic element concentrically mounted on at least one face of said sensing portion and forming therewith a diaphragm assembly, clamping means for rigidly supporting said mounting portion of the diaphragm member, housing means for spacedly enclosing said diaphragm assembly to allow normal mode vibratory flexure thereof at resonant frequency, and electrode means electrically coupled to the faces of said ceramic element and responsive to flexure thereof; further characterized in that

said diaphragm member is formed of a material having thermal properties selected to be closely similar to those of said ceramic element, whereby variability of the resonant frequency of said diaphragm assembly due to differential temperature response of diaphragm member and ceramic element is reduced to a small residual variation,

said clamping means is formed of a material having thermal properties which differ from those of said diaphragm member and produce radial stress in said mounting portion of the diaphragm member in a direction to cause variation of said resonant frequency larger and opposite to said residual variation,

said diaphragm member including an integrally formed radially flexible section interposed between said mounting portion and said sensing portion, which section partially isolates the diaphragm portion from radial stress in the mounting portion,

the configuration of said flexible section being selected to transmit to the sensing portion an amount of said radial stress which approximately compensates said residual frequency variation.

4,190,783

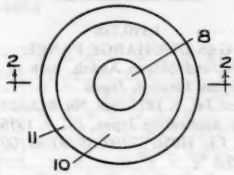
ELECTROACOUSTIC TRANSDUCERS OF THE BI-LAMINAR FLEXURAL VIBRATING TYPE WITH AN ACOUSTIC DELAY LINE

Frank Massa, Randolph, Mass., assignor to The Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, Cohasset, Mass.

Filed Jul. 25, 1978, Ser. No. 927,893
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—324 10 Claims

1. In combination in an electroacoustic transducer, a flexurally vibratile plate assembly comprising a plurality of bonded

plates at least one of which is capable of changing its dimensions upon being subjected to the influence of an electrical signal, suspension means for supporting said vibraplate assembly, said suspension means characterized in that the flexural stiffness of said suspension means is less than the flexural stiffness of said vibratile plate assembly whereby said suspension means does not significantly impede the free flexural displacement of the vibratile plate assembly when it is operated at its fundamental free flexural resonant mode of vibration, said suspension means further characterized in that it provides an acoustic seal at the peripheral edge ofsaid vibratile plate to prevent the flow of sound vibrations between the opposite peripheral faces of said vibratile plate assembly when it is operating at its fundamental free resonant mode of vibration, said vibratile plate assembly further characterized in that when



it is operating at its fundamental free resonant frequency mode, the displacement of the peripheral area of the vibratile surface of said vibratile plate assembly is of opposite phase compared with the displacement of the central area of said plate assembly, a second plate member having a center opening, said second plate member is positioned in close proximity to the vibratile surface of said vibratile plate assembly and positioned so that the center of the opening in said second plate is in alignment with the central portion of said vibratile plate assembly, said second plate member further characterized in that the area of the center opening does not exceed 50% of the total vibrating area of said vibratile plate assembly, the area of said vibratile plate assembly characterized in that the transverse dimensions of said vibratile plate assembly are greater than $\frac{1}{4}$ wavelength and less than $1\frac{1}{4}$ wavelength of sound in the medium at the frequency of operation.

4,190,784

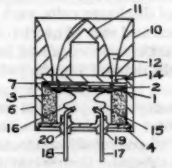
PIEZOELECTRIC ELECTROACOUSTIC TRANSDUCERS OF THE BI-LAMINAR FLEXURAL VIBRATING TYPE

Frank Massa, Randolph, Mass., assignor to The Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, Cohasset, Mass.

Continuation-in-part of Ser. No. 927,893, Jul. 25, 1978. This application Sep. 15, 1978, Ser. No. 942,481

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—324 **12 Claims**



1. In combination in an electroacoustic transducer, a flexurally vibratile plate assembly comprising a plurality of bonded plates at least one of which is capable of changing its lateral dimensions upon being subjected to the influence of an electrical signal, support means for supporting said vibratile plate assembly, said support means characterized in that it does not significantly impede the free flexural displacement of the vibratile plate assembly when it is operated at its fundamental free flexural resonant mode of vibration, said vibratile plate assembly characterized in that when it is operating at its fundamental free resonant frequency mode, the displacement of the peripheral area of the vibrating surface of said vibratile plate assembly is of opposite phase compared with the displacement of the central area of said vibratile plate assembly, a cup-shaped housing structure having a closed bottom portion and an axially-aligned open end portion, said housing structure adapted for enclosing said vibratile plate assembly, said support means characterized in that it holds said vibratile plate assembly in axial alignment with said housing structure when it is enclosed in said housing, a lid, means for attaching said lid to said open end of said housing structure whereby to close said open end, said lid characterized in that it has an opening, and further characterized in that said opening is concentric with the axis of said cup-shaped housing when said lid is attached to close said housing, spacing means for locating the vibratile surface of said vibratile plate assembly in close spaced proximity to the inner wall surface of said lid when said lid is attached to said housing structure, said spacing means characterized in that the total contact area of said spacing means is negligibly small compared with the surface area of said vibratile disc, said spacing means further characterized in that it includes at least three separate small surfaces located in a plane perpendicular to the axis of said cup-shaped housing, said spacing means further characterized in that the central axis of said vibratile plate assembly is held in alignment with the central axis of said housing structure, said opening in said lid further characterized in that the area of the opening does not exceed 50% of the total area of said vibratile plate assembly, said lid further characterized in that the radial dimension between the outer peripheral edge of the opening in said lid and the outer peripheral edge of said closely spaced vibratile plate assembly is greater than approximately $\frac{1}{4}$ wavelength and less than approximately $\frac{3}{4}$ wavelength of the sound in the medium at the frequency of operation whereby said lid acts as an acoustic delay line for reversing the out-of-phase acoustic vibrations generated by the outer peripheral area of the vibratile disc before they reach the opening in said lid whereby the delayed peripheral vibrations add constructively to the vibrations generated by the central area of said vibratile disc.

4,190,785

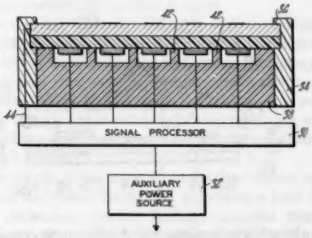
PRESSURE SENSITIVE SIGNAL GENERATOR USING PIEZOELECTRIC COATING

Harry W. Kompanek, Santa Barbara, Calif., assignor to Essex Transducers Corporation, Carpinteria, Calif.

Continuation-in-part of Ser. No. 748,993, Dec. 9, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,998

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—330 **15 Claims**



1. An electrical signal generator comprising:

a substrate of conductive material which forms a first electrode;

a coating of piezoelectric material including an interbonded mixture containing phosphorous, zirconium, titanium and

chromium chemically bonded to one side of the substrate by the attachment of phosphate ions in the mixture to the substrate due to ionic bonding;

a region of conductive material which is joined to the exposed surface of the piezoelectric material and forms a second electrode; and

electrical conduction means attached to the first electrode and the second electrode to conduct away as useful electrical signals, electric pulses established across the piezoelectric material due to force applied to the substrate.

4,190,786

DISCHARGE LAMP

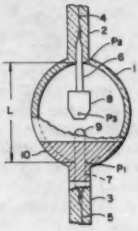
Takehiro Kira, Akashi, Japan, assignor to Ushio Denki Kabushikikaisha, Japan

Filed Mar. 29, 1978, Ser. No. 891,460

Claims priority, application Japan, Dec. 23, 1977, 52-153515

Int. Cl.[2] H01J *61/16, 61/20, 61/30*

U.S. Cl. 313—184 **29 Claims**



1. A source of ultraviolet radiation comprising:

a sealed bulb, at least a portion of said bulb being transmitting to wavelengths below 3000 angstroms,

a pair of electrodes sealed in said bulb,

mercury sealed within said bulb in amount from 1 to 13 mg. per cc. of volume of said bulb, and

at least one rare gas sealed within said bulb at a pressure from 2 to 10 atm. at 25° C.

4,190,787

PHOSPHORUS LUMINESCENT DISPLAY TUBE

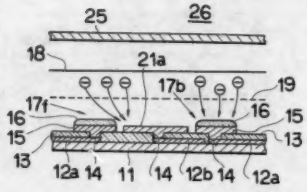
Takao Kishino; Yoichi Mera; Satoru Makita, and Tsutomu Morooka, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Chiba, Japan

Filed Jun. 12, 1978, Ser. No. 914,948

Claims priority, application Japan, Jul. 7, 1977, 52-80439

Int. Cl.[2] H01J *63/02, 63/06*

U.S. Cl. 313—494 **5 Claims**



1. A phosphorus luminescent display tube comprising:

a vacuum casing made up of a substrate and a light transparent front bulb bonded to each other;

an insulating layer formed on said substrate;

a filamentary cathode provided in said vacuum casing for emitting thermions when energized and heated;

a control electrode provided in said vacuum casing for accelerating and controlling the thermions emitted from said filamentary cathode;

a plurality of pattern display sections, mounted on said insulating layer, each composed of a plurality of segment anodes each coated with a phosphor layer for emitting light when the thermions impinge thereon, said segment anodes being selectively given an anode potential; said control electrode being located between said cathode and said display sections and,

auxiliary anode conductors mounted on said insulating layer in the vicinity of and substantially on the same level with the segment anodes of said pattern display sections and having a bias voltage that is kept positive with respect to said filamentary cathode so as to absorb electron oscillations occuring in the vicinity of said segment anodes to which the anode potential is not given.

4,190,788

GAS DISCHARGE PANEL

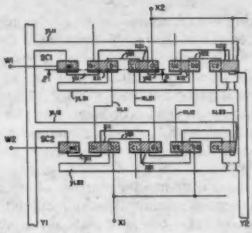
Kazuo Yoshikawa, and Shizuo Andoh, both of Kobe, Japan, assignors to Fujitsu Limited, Japan

Filed Jul. 7, 1977, Ser. No. 813,627

Claims priority, application Japan, Jul. 9, 1976, 51-82410

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169.4 **24 Claims**



1. A gas discharge panel comprising

first and second insulating substrates arranged in parallel and separated by a discharge gap,

a discharge gas sealed within said gap,

a first electrode set on the inside surface of said first substrate and a second electrode set on the inside surface of the second substrate,

the projected area of each electrode of one of the said two sets having an area of partial overlap with the area of at least one corresponding electrode of the other of said sets, said projection being normal to the surface of said substrates,

a dielectric layer covering said electrode sets on said substrates,

said first and second electrode sets comprising the electrodes of a plurality of discharge cells, each of said cells corresponding to each said area of overlap in the discharge gap between said inside surfaces of said substrates, and

said discharge cells determining the position of at least one shift channel,

connecting conductors are provided on each of said substrates to connect said electrodes on each substrate to define groups of commonly-connected alternating electrodes on each substrate, further comprising a plurality of shift channels,

a pair of connecting conductors on the first substrate define two of said electrode groups along each of said shift channels, and

connecting conductors on the second substrate connect in common corresponding electrodes of said plurality of shift channels of said second set, said grouping extending across the direction of said shift channels,

at least two of said shift channels are connected in series as

a result of the spacing and the phase of a adjacent discharge cells at the ends of each of said shift channels to result in at least one longer shift channel, and

a write electrode is provided at one end of said longer shift channel.

4,190,789

DRIVING SYSTEM FOR A SELF-SHIFT TYPE GAS DISCHARGE PANEL

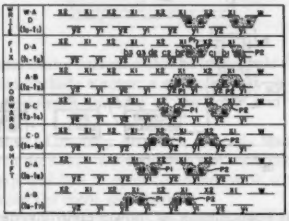
Toyoshi Kawada; Hisashi Yamaguchi, both of Kobe, and Hirofumi Kashiwara, Kasai, all of Japan, assignors to Fujitsu Limited, Japan

Filed May 16, 1978, Ser. No. 906,342

Claims priority, application Japan, May 17, 1977, 52-57210; May 19, 1977, 52-57989

Int. Cl.² H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169.4 **23 Claims**



1. A system for driving a multi-row self shift type gas discharge panel for displaying information in the form of discharge spots, said panel having a plurality of shift rows, each of said shift rows comprising at least one shift channel, each said shift channel having a regular and periodic arrangement of discharge cells, said discharge cells being defined by a plurality of electrode groups, said system comprising:

means for selecting at least one of said shift rows;

means for applying shift operation voltages to the electrode groups defining the discharge cells of the shift channels of said selected shift rows(s) for shifting the discharge spots in said selected shift row(s) in a predetermined one of forward and backward directions; and

means for applying sway operation voltages to the electrode groups defining the discharge cells of the shift channels of the non-selected one(s) of said plurality of shift rows for swaying the discharge spots in the shift channels of said non-selected shift rows within a predetermined number of adjacent discharge cells of said shift channels of said non-selected shift rows during said shift operation of discharge spots in said selected shift rows;

whereby the information in said selected shift row(s) is shifted while the information in said non-selected shift row(s) is displayed in predetermined locations by said sway operation.

4,190,790

ISOLATOR CIRCUIT FOR USE WITH FREQUENCY SENSITIVE SWITCHING CIRCUIT

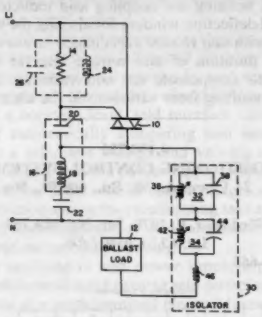
John L. Plumb; Sheppard Cohen, both of Danvers, and Paul H. Ingalls, Swampscott, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 29, 1978, Ser. No. 974,278

Int. Cl.² H04Q *1/45;* **H05B** *41/36*

U.S. Cl. 315—313 **12 Claims**

1. An isolator circuit for use in a power system including a ballasted load, a power circuit comprising first and second electrically energized conductors carrying power for the load, a frequency generator for applying a first control signal to the power circuit remotely of the load, and a frequency sensitive switching circuit coupled between the first conductor and one side of the load for controlling the energization of said ballasted load in response to said first control signal applied to the power circuit, the second side of the load being connected to the second conductor, said isolator circuit comprising, circuit



means tuned to block said first control signal, and means for connecting said tuned circuit means between said switching circuit and said one side of the ballasted load.

4,190,791

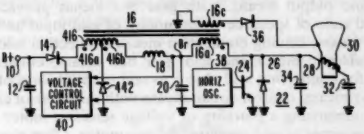
SWITCHING REGULATOR FOR TELEVISION DEFLECTION CIRCUIT WITH IMPROVED ULTOR VOLTAGE REGULATION

James E. Hicks, New Palestine, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 2, 1978, Ser. No. 957,221

Int. Cl.² H01J *29/70*

U.S. Cl. 315—408 **9 Claims**



1. A regulator drive arrangement for a television display apparatus, comprising:

a controllable switch, a filter inductor, a first winding and a deflection switch coupled across a source of unregulated direct voltage for providing a path for the flow of an increasing current through said inductor during those intervals in which said controllable switch is closed;

a rectifier coupled to a terminal of said source and with said inductor for providing a path for the flow of a decreasing current through said inductor during those intervals in which said controllable switch is open;

a capacitor coupled with said inductor and to a terminal of said source for integrating said increasing and decreasing current through said inductor to form an operating voltage across said first winding and said deflection switch;

a control circuit coupled to said controllable switch and to a source of voltage representative of said operating voltage for controlling said controllable switch and stabilizing said operating voltage;

a deflection winding and retrace capacitance means coupled across said deflection switch for providing a path for the flow of deflection current during recurrent trace and retrace intervals, said retrace intervals being dependent upon the inductance in parallel with said retrace capacitance means;

an ultor generator coupled to said first winding for generating an ultor voltage, variations in said ultor voltage resulting from variations in the ultor current and from variations in the duration of said retrace interval; and

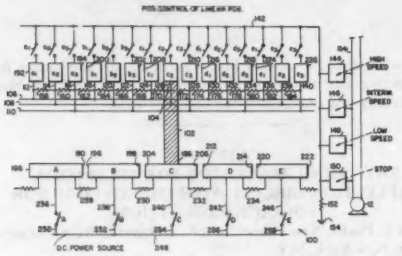
a second winding serially coupled with said inductor for providing a path for the flow of said increasing and decreasing currents, said second winding being coupled with said first winding for coupling said inductor in parallel with said deflection winding for altering the inductance in parallel with said retrace capacitance means and for altering said duration of said retrace interval in a manner tending to compensate for said variation in said ultor voltage resulting from variations in the ultor current.

4,190,792

POSITIONING CONTROL SYSTEM

Vincent Chan, 24 Chang An W. Rd., 6th Fl., Rm 601, Taipei, Taiwan

Filed Mar. 9, 1978, Ser. No. 884,754
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—663 **4 Claims**



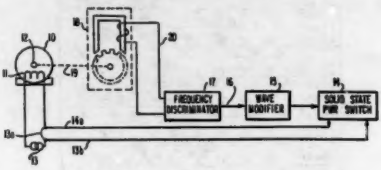
1. A position control systme for subjecting an object to motion in a controlled manner comprising a base, a universal electric moter mounted a said base, gear box means having input and output means, with gear box means providing a selected ratio of speed between motion of said input and said output means, driving connection means connection said universal electric motor and said gear box means, connecting means for connecting said object to said output means of said gear box means, control circuit means with said control circuit means comprising a plurality of voltage sensitive motor controls connected to said universal electric motor, a first plurality of spaced electrical conductors, a second plurality of spaced electrical conductors with said second plurality of spaced electrical conductors disposed opposite said first plurality of spaced electrical conductors, a movable conductive brush disposed for motion responsive to motion of said object and disposed to connect opposite conductors of said first and said second pluralities of spaced electrical conductors, first electrical resistance means connecting said first plurality of spaced electrical conductors, second electrical resistance means connecting said second plurality of spaced electrical conductors circuit connection means connecting said first and said second electrical resistance means, a source of direct current power connected to said circuit connection means, a plurality of switch means disposed one each, connecting said first plurality of conductors with said first electrical resistance means and connecting said second plurality of conductors with said second electrical resistance means so that closing selected switches of said plurality of said switch means causes selected resistance resistance values to be electrically connected within said control circuit resulting in selected voltages being sensed by said boltage sensitive motor controls thereby causing said universal electric motor to drive said object to a position corresponding to said selected switches, a pulley mounted on said input means on said gear box means, a drive belt connecting said pulley and said universal electric motor, comprising a pair of plates, a slip-friction layer disposed between said plates and fastened to a first of said pair of plates and fastened to a first of said pair of plates, with said first plate connected to said drive belt and with said second plate connected to said input means on said gear box means and spring loading means disposed to urge said pair of plates into contact so that roque in excess of a predetermined value causes said pair of plates of slip relative to each other thereby preventing damage to said position control system.

4,190,793

ENERGY ECONOMIZER FOR INDUCTION MOTORS

Louis W. Parker, 2040 N. Dixie Hwy., Ft. Lauderdale, Fla. 33300, and Rhey W. Hedges, Ft. Lauderdale, Fla., assignors to Louis W. Parker, Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 839,945, Oct. 6, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,698
Int. Cl.[2] H02P *7/36*
U.S. Cl. 318—800 **20 Claims**

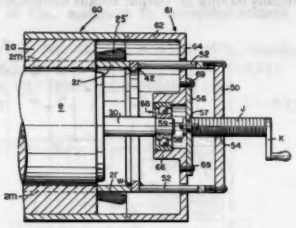


1. An energy economizing AC power control system operative to reduce the iron and copper losses in a conventional induction motor by varying the form and magnitude of the energization voltage coupled thereto, comprising a conventional AC induction motor having a stator winding and a rotor adapted to be coupled to a load, a sine wave power source for energizing said stator winding to effect rotation of said rotor, and a conditionally closed loop positive feedback control means that becomes operative to control the energization of said stator winding from said power source at a particular speed near the full speed of said motor, said closed loop positive feedback control means comprising: motor load detecting means coupled to said rotor and operative to produce a frequency modulated signal related to the load on said motor, an inverting DC amplifier coupled to said load detecting means for producing a DC control voltage which varies in magnitude in inverse relation to the speed and load of said motor, wave modifier means coupled to the output of said DC amplifier and responsive to said DC control voltage, said wave modifier means including switching means disposed between said sine wave power source and said stator winding, the conduction time of said switching means being controllable during each cycle from said power source as a function of the magnitude of said DC control voltage, said wave modifier means being operative to apply full sine waves of voltage from said power source to said stator winding during rotational start-up and speed build-up of said motor and, as said motor reaches said particular speed, then being operative to substantially maintain said particular speed by varying the electrical angle of each cycle of said power source which is actually coupled to said stator winding to provide varying fractions of each sine wave of voltage from said power source to said stator winding in accordance with the inherent electro-mechanical properties of said motor and the energy requirements imposed on said motor by the rotor load at any given moment, whereby said closed loop positive feedback control means functions to substantially reduce the iron and copper losses of said conventional motor by causing the average current supplied from said power source to said stator winding to be supplied primarily as a function of the said properties of said motor and the load on said motor as the load on said motor varies between zero and maximum rated motor load.

4,190,794
ALTERNATING CURRENT MOTOR WITH ADJUSTABLE OUTPUT TORQUE BY MEANS OF ADJUSTABLE MAGNETIC BARS

Kreso Mikulic, 1634 Crest Hill, Cincinnati, Ohio 45237

Filed Mar. 20, 1978, Ser. No. 888,331
Int. Cl.[2] H02P 7/08
U.S. Cl. 318—831 12 Claims



1. An alternating current motor of both single and polyphase types which include a rotor, a stator, and an air gap between adjacent peripheral surfaces of the rotor and stator which comprises:

a plurality of radially disposed, laterally spaced, elongate slots in the stator wherein each slot terminates in an inner air gap which is in open communication with the air gap between the rotor and stator;

a plurality of windings disposed in each stator slot so arranged as to provide an elongate open space or channelway between the windings and the said inner air gap;

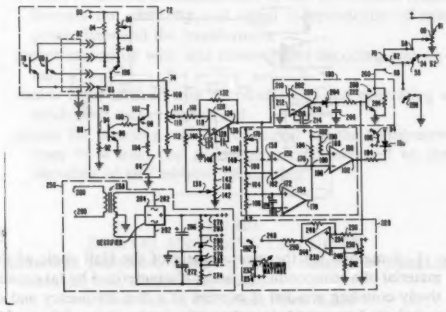
a plurality of elongate, magnetic control rods slideably receivable in the said elongate open space or channelway of a stator slot; and

means imparting selective, uniform, simultaneous, endwise movement to said rods between fully advanced and retracted positions relative to their respective open spaces or channelways of the stator slots for changing the paths and intensity of the stator flux enroute to the rotor.

4,190,795
CONSTANT INTENSITY LIGHT SOURCE

Stephen M. Schultheis, West Covina, Calif., assignor to Coberly & Associates, Pasadena, Calif.

Filed Sep. 9, 1977, Ser. No. 831,904
Int. Cl.[2] G05F 1/56
U.S. Cl. 323—17 3 Claims



1. A power apparatus for driving a lamp at constant light intensity in photolithographic processes, including:

an optical sensor circuit wherein a phototransistor indicates the intensity of light of a desired wavelength range incident on a surface by varying an applied voltage to yield a sensor feedback voltage corresponding to that intensity, said phototransistor positioned directly in the path of said light for exposure to the full intensity thereof;

a switching direct current power supply capable of producing a regulated variable power output to said lamp in response to an electrical control input;

a feedback interface circuit between said optical sensor circuit and said power supply providing said electrical control input to said power supply in response to said sensor feedback voltage to maintain the intensity of said light incident on said surface at a constant level, said interface circuit including means for automatically comparing said sensor feedback voltage to a reference voltage and varying said electrical control input and thus the power supply output to said lamp to eliminate any difference in those voltages, and

internal calibration means for recalibrating said apparatus after the optical characteristics of said lamp have been altered, said calibration means comprising:

means for applying to said power supply a predetermined electrical control input causing said power supply to drive said lamp at a predetermined electrical power level;

means for manually adjusting said reference voltage relative to said sensor feedback voltage resulting from said predetermined electrical power level; and

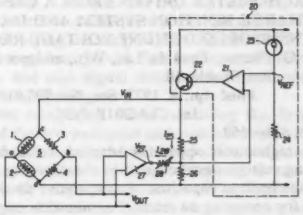
means for automatically indicating when said reference voltage substantially equals the sensor feedback voltage resulting from said predetermined electrical power level comprising a light emitting diode and a window comparator circuit automatically analyzing the output of said automatic comparison means of said interface circuit and igniting said light emitting diode when said output of said automatic comparison means becomes substantially zero, indicating that said reference voltage substantially equals said sensor feedback voltage;

whereby said power apparatus can be readily calibrated to operate at a constant intensity of lamp light incident on said surface by manually adjusting said reference voltage to substantially equal said sensor feedback voltage resulting from said predetermined electrical power level, said constant intensity having a value substantially equal to the intensity produced on said surface at said predetermined electrical power level.

4,190,796
PRESSURE DETECTING APPARATUS HAVING LINEAR OUTPUT CHARACTERISTIC

Akira Ishii, Machida, Japan, assignor to Tokyo Shibaura Electric Company, Limited, Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,109
Claims priority, application Japan, Jun. 2, 1977, 52-65099; Sep. 10, 1977, 52-109130
Int. Cl.[2] G01L 9/06
U.S. Cl. 323—75 N 10 Claims



1. A pressure detecting apparatus comprising:

a bridge circuit having semiconductor pressure sensitive elements;

means for supplying a constant voltage to said bridge circuit wherein said constant voltage supplying means includes a voltage controlling amplifier having a reference voltage input, and a resistance element connected to the reference

voltage input of the voltage controlling amplifier, the resistance-temperature coefficient of the resistance element being equal to or higher than those of the semiconductor pressure sensitive elements in said bridge circuit;

an amplifier for amplifying the output of said bridge circuit; and

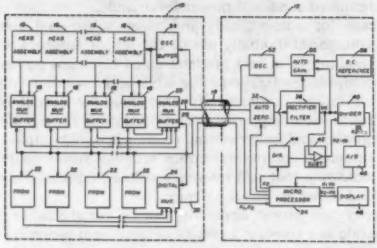
a voltage correcting means connected between the input of said amplifier and the input of said bridge circuit for feeding the output of said bridge circuit back to the input of said bridge circuit.

4,190,797

CAPACITIVE GAUGING SYSTEM UTILIZING A LOW INTERNAL CAPACITANCE, HIGH IMPEDANCE AMPLIFIER MEANS

Thomas H. Lecklider, Bishop's Stortford, England, and John J. Bowers, Medina, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 31, 1978, Ser. No. 891,957
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R **20 Claims**



1. A capacitive gauging apparatus for measuring the distance between a probe means and a work piece comprising:

a probe means positionable in proximity to a work piece to form a capacitive means therewith;

a capacitor in series with said probe means;

a voltage source in series with said capacitor and said probe means;

a low internal capacitance, high impedance amplifier means having an input connected between said capacitor and said capacitive means, said amplifier means including a FET having its gate connected to the input of said amplifier, said FET in series with a constant current source; and

processing means for processing the output of said amplifier into a representation of the distance between said capacitive probe and said work piece.

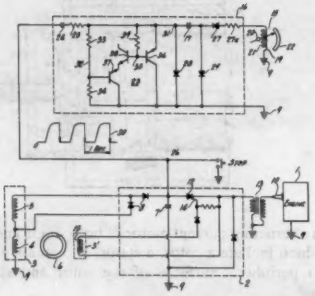
4,190,798

TACHOMETER DRIVEN FROM A CAPACITOR DISCHARGE IGNITION SYSTEM AND INCLUDING A TRANSISTORIZED SHUNT VOLTAGE REGULATOR

Arthur O. Fitzner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 6, 1977, Ser. No. 785,015
Int. Cl.[2] G01P *7/00*
U.S. Cl. 324—169 **11 Claims**

1. A tachometer apparatus adapted to be driven from a repeating voltage signal created by the charging and discharging of the ignition capacitor of a capacitive discharge ignition system for operating an internal combustion engine, comprising an ignition signal input means, a tachometer measuring capacitor means having a predetermined fixed value of capacitance, a readout meter connected in series with said tachometer measuring capacitor means for one polarity of current flow, capacitive coupling means connecting said tachometer capacitor means to said ignition signal input means, diode means to discharge the tachometer measuring capacitor means during the ignition capacitor charging cycle and to rapidly charge the measuring capacitor during the ignition capacitor discharging cycle, and a voltage regulator connected to regulate the level of the charge on said measuring capacitor means and thereby the charge flowing through said meter to an essentially constant value for each cycle, said regulator having a negative temperature coefficient and including a sensing resistor branch connected to the measuring capacitor means to sense the voltage of the measuring capacitor means and a regulating transistor means having an output means connected to shunt current



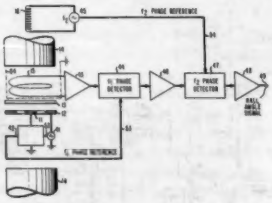
from the measuring capacitor means, said regulating transistor means having an input means, a threshold reference voltage responsive means connected between said input means of said regulating transistor means and said resistor branch to drive said regulating transistor means by the difference in voltage between the voltages of the measuring capacitor and the reference voltage responsive means and thereby regulate the charging of the measuring capacitor, said resistor branch includes a machine trimmable resistance means to control the threshold level of said regulator.

4,190,799

NONCONTACTING MEASUREMENT OF HALL EFFECT IN A WAFER

Gabriel L. Miller, Westfield, and David A. H. Robinson, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1978, Ser. No. 935,518
Int. Cl.[2] G01R *33/00*
U.S. Cl. 324—239 **13 Claims**



1. A method for the measurement of the Hall angle of the material of a semiconductor wafer characterized by (a) capacitively coupling a radial rf current of a first frequency and of preselected magnitude into the wafer, in the plane of the wafer; (b) imposing, on the wafer, in the region of the rf current, a magnetic field approximately normal to the wafer, thus producing a circular current at the first frequency in the plane of the wafer, (c) inductively picking up a first frequency measurement signal produced by the circular current and (d) measur-

ing the first frequency measurement signal as a measure of the magnitude of the circular current by a method including phase sensitive detecting, thus producing an output signal related to the magnitude and sign of the Hall angle of the wafer material.

4,190,800

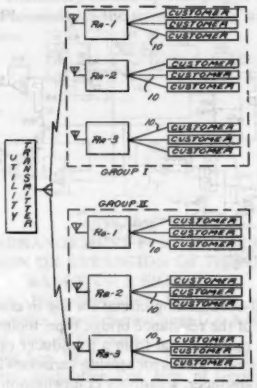
ELECTRICAL LOAD MANAGEMENT SYSTEM

Jack R. Kelly, Jr., Stone Mountain, and Glen P. Robinson, Jr., Atlanta, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation of Ser. No. 743,668, Nov. 22, 1976, abandoned. This application Dec. 12, 1978, Ser. No. 968,811

Int. Cl.[2] H04N 7/24; H04M 11/04

U.S. Cl. 325—37 **7 Claims**



1. An improved electrical load management system comprising:

a plurality of distribution transformers each having primary and secondary windings, each of said transformers coupling an electrical power line joined to its primary winding to distribution lines connected to its secondary winding and stepping down the voltage level of the power carried by the associated power line to a level to be supplied via the distribution lines to a group of electricity users, each distribution line servicing at least one of said users;

means for transmitting by radio from a central location a coded signal having address and command information;

a receiver located proximate each of said distribution transformers for receiving said signal independently of said power lines and the transformers;

means associated with said receivers for decoding said signal;

means responsive to said decoded signal for generating a modulated carrier signal; and

means for coupling said carrier signal via the distribution lines to at least one group of users determined by the decoding of said address information.

4,190,801

DIGITAL ENCODING CIRCUITRY

Richard E. DeFreitas, Westford, Mass., assignor to DeltaLab Research, Inc., Chelmsford, Mass.

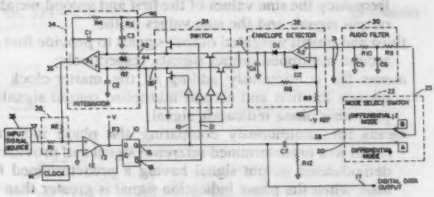
Filed Feb. 6, 1978, Ser. No. 875,336

Int. Cl.[2] H03K 13/22

U.S. Cl. 325—38 B **24 Claims**

1. In an electrical system of the type in which a digitally encoded signal is determined at least in part by the difference between a present value of an input signal and a reference signal representative of a past value of said input signal, improved circuitry for generating said reference signal, comprising

extraction means including a filter for extracting from the pattern of bits in said digitally encoded signal information relating to the time derivative of said present value to provide a corresponding control signal,



integrating means responsive to said control signal to provide said reference signal, and

modulating means for feeding back to an input of said filter a modulated signal comprising said control signal modulated by said encoded signal.

4,190,802

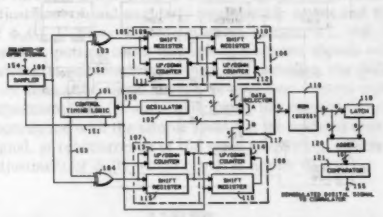
DIGITAL DEMODULATOR FOR PHASE SHIFT KEYED SIGNALS

Stephen N. Levine, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 17, 1978, Ser. No. 934,299

Int. Cl.[2] H04L 27/22

U.S. Cl. 325—320 **11 Claims**



11. In a digital demodulator for digital signals serially encoded according to phase shift keying (PSK) at a predetermined carrier frequency and predetermined bit frequency, said digital demodulator including an oscillator for providing a master clock signal at a multiple of the predetermined carrier frequency, timing circuitry responsive to the oscillator for providing first and second quadrature-related clock signals each at substantially the same frequency as the predetermined carrier frequency, a sampler for digitally sampling the PSK signal at the master-clock frequency and first and second multipliers for multiplying the sampled PSK signal and the first and second clock signals to provide first and second output signals, respectively, and said digital demodulator further including improvement comprising:

first one-bit integrating means receiving the first output signal of the first multiplier and continuously providing in response to the master clock signal a first weighted output signal and the first output signal delayed by one bit;

second one-bit integrating means receiving the delayed first output signal from the first one-bit integrating means for continuously providing in response to the master clock signal a second weighted output signal;

third one-bit integrating means receiving the second output signal of the second multiplier and continuously providing in response to the master-clock signal a third weighted output signal and the second output signal delayed by one bit;

fourth one-bit integrating means receiving the delayed sec-

ond output signal from the third one-bit integrating means for continuously providing in response to the master clock signal a fourth weighted output signal;

means for continuously taking at the master-clock frequency the trigonometric sine value of each of the first, second, third and fourth weighted output signals;

means for continuously multiplying at the master-clock frequency the sine values of the first and second weighted output signals and the sine values of the

third and fourth weighted output signals to provide first and second multiplied output signals, respectively;

means for continuously adding at the master-clock frequency the first and second multiplied output signals to provide a phase indication signal;

means for continuously comparing the phase indication signal to a predetermined reference signal and providing a demodulated output signal having a predetermined first state when the phase indication signal is greater than the predetermined reference signal and a predetermined second state when the phase indication signal is less than the predetermined reference signal.

4,190,803

MULTIFREQUENCY SUPERHETERODYNE RECEIVER WITH PRIORITY CHANNEL MONITORING

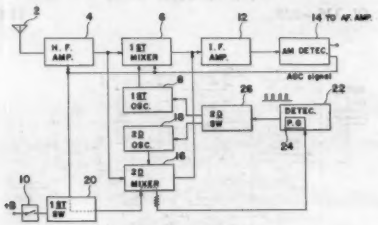
Eigo Imamura, Moriguchi, Japan, assignor to Sanyo Electric Company, Ltd., Moriguchi, Japan

Filed Apr. 25, 1978, Ser. No. 899,718

Claims priority, application Japan, Apr. 25, 1977, 52-48896

Int. Cl.[2] H04B *1/32*

U.S. Cl. 325—455 **10 Claims**



1. A receiver of the superheterodyne type for receiving radio wave signals on a predetermined number of channels, at least one of which is designated a priority channel while others are nonpriority channels, said receiver comprising in combination:

first circuit means operative to provide reception of a signal on said nonpriority channels;

second circuit means operative to provide reception of a signal on said priority channel;

means for producing an automatic gain control signal, said automatic gain control signal varying from a first controlling level during reception of any one of said signals to a second controlling level during the reception of no signal;

switching means coupled to said first and second circuit means and having at least first and second conditions of operation, the first condition being wherein the first circuit means is made operative and the second condition being wherein the second circuit means is made operative;

pulse generating means for providing to said switching means pulses having first and second output levels, said first output level causing the switching means to operate in the first condition and said second output level causing the switching means to operate in the second condition;

means for detecting the reception of a priority channel by the second circuit means in response to the variation of the automatic gain control signal to the first controlling level during a period in which the pulse generating means produces the second output level; and

means responsive to the detection of the detecting means for locking the pulse generating means to inhibit the generation of pulses and to continually produce the second output level.

4,190,804

SIGNAL-CONDITIONING CIRCUITS

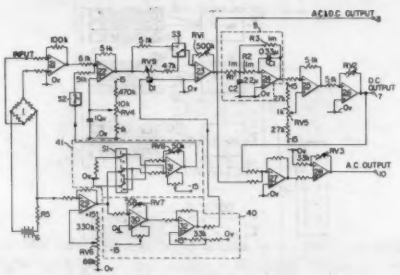
Clive R. Pyne, and Barry L. Welsh, both of Bedford, England, assignors to National Research Development Corporation, London, England

Filed Dec. 15, 1977, Ser. No. 860,776

Claims priority, application United Kingdom, Dec. 21, 1976, 53433/76

Int. Cl.[2] G01K *7/00*; G08B *23/00*

U.S. Cl. 328—3 **13 Claims**



1. A signal-conditioning circuit for use in combination with a transducer of the resistance bridge type, including means for receiving an output signal from a transducer of the resistance bridge type, sensor means for sensing variations in the temperature of the transducer, sensitivity compensation means including gain control means in the path of the transducer output signal responsive to the sensor means for controlling the gain applied to the transducer output signal in dependence upon the temperature of the transducer, and offset compensation means responsive to the sensor means to apply to the transducer output signal a DC offset voltage which varies with the temperature of the transducer.

4,190,805

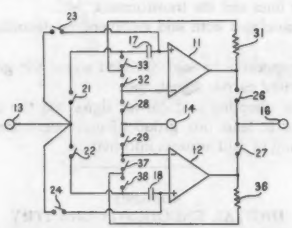
COMMUTATING AUTOZERO AMPLIFIER

David Bingham, Los Altos, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Dec. 19, 1977, Ser. No. 861,525

Int. Cl.[2] H03F *1/02*

U.S. Cl. 330—9 **7 Claims**



1. An active analog processing system comprising

first and second like signal processing circuits with each having first and second inputs,

a capacitor connected to the first input of each of said circuits,

input terminals and an output terminal,

switching means operable to alternately connect each of said

circuits between said input and output terminals through said capacitors, and said switching means also being operable to alternately disconnect said circuits from said terminals and resistively couple the output of the disconnected circuit to the first input through the said capacitor thereof and to the second input and to connect the first circuit input directly to a low impedence reference source, such as the input terminal of the system or a ground reference of the system for charging the capacitor with a voltage having a polarity to substantially cancel input low frequency noise, and

means operating said switching means at a predetermined frequency of operation whereby signals applied to the system are alternately passed by said circuits and the circuits are alternately zeroed by charging of the capacitors thereof to minimize the transmission of noise signals by the system.

4,190,806

CIRCUIT ARRANGEMENT FOR THE SELECTIVE COMPRESSION OR EXPANSION OF THE DYNAMIC RANGE OF A SIGNAL

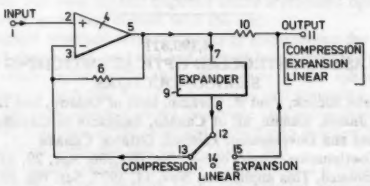
Jürgen Wermuth, Peine-Stederdorf, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 943,978

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744249

Int. Cl.² H04B *1/64*

U.S. Cl. 330—51 **9 Claims**



1. A circuit arrangement for the selective compression or expansion of the dynamic range of an input signal applied to an input terminal and for generating an output signal at a first output terminal, comprising

an amplifier having a feed-back resistor connected between its output and input,

means coupling the input of said amplifier to said input terminal and means coupling the output of said amplifier to said first output terminal,

a dynamic expander having a low resistance output circuit, the input of said expander being coupled to the output of said amplifier, and

switching means having first and second positions, said switching means connecting said expander in parallel with said feed-back resistor in said first position to provide compression of the dynamic range of said input signal and connecting said expander to said first output terminal in said second position to provide expansion of the dynamic range of said input signal, said feed-back resistor being connected across said amplifier regardless of the position of said switching means.

4,190,807

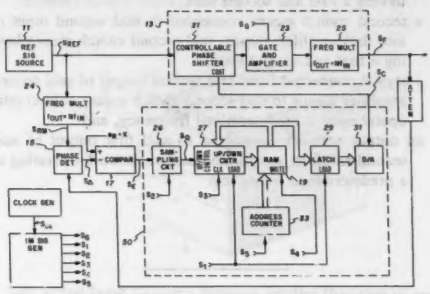
SAMPLED ERROR PHASELOCK OR FREQUENCYLOCK SYSTEMS

Robert J. Weber, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 3, 1978, Ser. No. 921,676

Int. Cl.² H03B *3/04*

U.S. Cl. 331—1 A **15 Claims**



14. The system comprising:

angularly modulatable means for providing a carrier signal whose phase $\phi_a(t)$ is to eventually follow $\phi_b(t)$ where $\phi_b(t)$ is a prescribed function of time,

means for providing a signal which is a function of difference between $\phi_a(t)$ and $\phi_b(t)$, and

means for (i) storing all at one time, and serially outputting, 1st through Uth individual control signals for producing adjustment of said angularly modulatable means and thus of $\phi_a(t)$, U being a predetermined integer ≥ 2, and the serial outputting of 1st through Uth control signals reoccurring at predetermined times, (ii) sampling the difference indicative signal during at least one control signal adjustment of $\phi_a(t)$, and (iii) updating this control signal in accordance with the sample such that the updated control signal, at reoccurrence of the serial outputting, effects an adjustment of $\phi_a(t)$ which brings it nearer to $\phi_b(t)$.

4,190,808

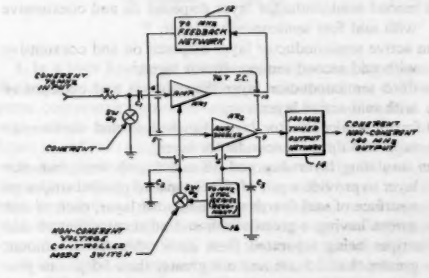
AMPLIFIER-OSCILLATOR FREQUENCY MULTIPLIER APPARATUS

Lyle A. Fajen, Scottsdale, Ariz., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1978, Ser. No. 889,469

Int. Cl.² H03B *5/36*; H03F *3/195*

U.S. Cl. 331—59 **10 Claims**



1. An amplifier-oscillator frequency multiplier apparatus comprising in combination:

a first amplifier means having a first and second input and an output,

a second amplifier means having an input and a first and second output,

a feedback means operating at a first predetermined frequency, said feedback means being connected from said output of said first amplifier means to said input of said second amplifier means

a first switch means connected from said first input of said first amplifier means to ground, said first switch means having a first and second state,

a second switch means connected to said second input of said first amplifier means, said second switch means having a first and second state,

a crystal connected from said second output of said second amplifier means to said second switch means, said crystal operating at a predetermined frequency, and

an output network connected to said first output of said second amplifier means, said output network operating at a predetermined frequency.

4,190,809

STRIPE LASERS

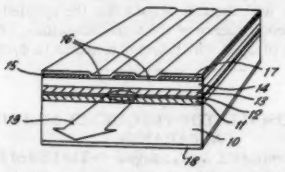
Colin H. L. Goodman, Loughton, and Paul A. Kirkby, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,468

Claims priority, application United Kingdom, Oct. 13, 1976, 42611/76

Int. Cl.² H01S *3/19*

U.S. Cl. 331—94.5 H **8 Claims**



1. An injection laser comprising:

a first metal contact layer;

a first semiconductor layer disposed on and coextensive with said first contact layer;

a second semiconductor layer disposed on and coextensive with said first semiconductor layer;

an active semiconductor layer disposed on and coextensive with said second semiconductor layer;

a third semiconductor layer disposed on and coextensive with said active layer;

a fourth semiconductor layer disposed on and coextensive with said third semiconductor layer;

an insulating layer disposed on said fourth semiconductor layer to provide a pair of closely spaced parallel stripes on a surface of said fourth semiconductor layer, each of said stripes having a given width and adjacent edges of said stripes being separated from each other by an amount greater than 2.5 μm and not greater than 5.5 μm to promote real dielectric waveguiding of the zero order mode of said laser in preference to either gain-guiding or to waveguiding of the first order mode of said laser; and

a second metal contact layer disposed on and coextensive with said insulating layer and said stripes.

4,190,810

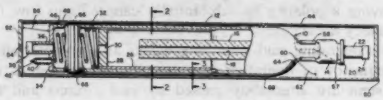
GAS LASER WITH RESISTIVE STRIP ARRANGEMENT FOR STARTING ENHANCEMENT

Allan E. Bayley, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 1, 1978, Ser. No. 901,879

Int. Cl.² H01S *3/097*

U.S. Cl. 331—94.5 PE **7 Claims**



1. In a gas laser comprising a tubular member of electrically insulating material, a laser gas contained within said tubular member, a tubular cathode coaxially disposed within said tubular member, an anode disposed at one end of said tubular member, and means for applying a voltage between said anode and said cathode, the improvement for enhancing the commencement of an electrical discharge in said laser gas between said anode and said cathode comprising:

a strip of electrically conductive plastic disposed on the outer lateral surface of said tubular member and having a first portion extending longitudinally along said tubular member for most of the length of said tubular member and having a second portion extending circumferentially along the lateral surface of said tubular member in the vicinity of the end of said tubular member remote from said anode, a tape of electrically insulating material having a width greater than that of said strip overlying both said first and second portions of said strip and adhesively contacting said strip and portions of the surface of said tubular member on both sides of said strip in a manner holding said first and second portions of said strip against said tubular member, and means for electrically connecting the end of said first portion of said strip remote from said second portion to said anode.

4,190,811

LASER CONTROLLED OPTICAL SWITCHING IN SEMICONDUCTORS

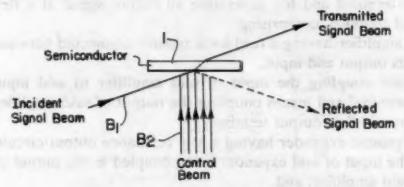
A. John Alcock; Paul B. Corkum, both of Ottawa, and Douglas J. James, Kanata, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 681,586, Apr. 29, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,840

Claims priority, application Canada, May 22, 1975, 227587

Int. Cl.² H01S *3/101*

U.S. Cl. 331—94.5 M **18 Claims**



1. An apparatus for switching a signal laser beam having a predetermined infrared radiation frequency comprising:

semiconductor means normally transparent to infrared radiation of the signal beam frequency;

signal laser means for providing the infrared radiation signal beam and for directing said signal beam obliquely at a predetermined angle onto the surface of said semiconductor means; and

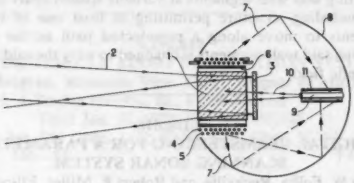
control laser means for providing a control beam for irradiating the surface of said semiconductor means, said control laser means beam having a radiation frequency sufficiently high to produce free carriers in said semiconductor means and having sufficient radiation intensity and time duration to produce a free carrier density greater than the critical density for the signal beam resulting in substantially complete reflection of the signal beam from said semiconductor means surface.

4,190,812

LASER HEAD

Louis Jacob, Bretigny sur Orge, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Jan. 10, 1978, Ser. No. 868,241
Claims priority, application France, Jan. 21, 1977, 77 01704
Int. Cl.[2] H01S *3/09*
U.S. Cl. 331—94.5 P **12 Claims**



1. A laser head comprising:
a neodymium-doped active glass rod;
a light source disposed with respect to said rod such that a part of the light emitted by this source illuminates the active material of said rod in order to render it capable of amplifying a laser beam at a wavelength of 1.06 microns passing through the material and the remaining part of the light does not illuminate the active material, a portion of the active material being less illuminated than the rest;
at least one ruby crystal disposed inside a resonant optical cavity, and being coaxial with the rod;
a concave spherical reflector partially surrounding the rod and the crystal, said rod and crystal being disposed substantially symetrically about the center of the spherical reflector such that the crystal receives said remaining part of the light which does not illuminate said active material after reflection in the spherical reflector to produce laser radiation along the axis of the cavity; and
a plane mirror which reflects the laser beam and is transparent to the laser radiation of the ruby crystal, said mirror being disposed between the rod and the ruby perpendicularly to the common axis of the rod and the ruby to allow said laser radiation to pass through the mirror to illuminate said less illuminated portion of the active material.

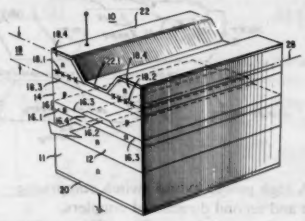
4,190,813

STRIP BURIED HETEROSTRUCTURE LASER

Ralph A. Logan, Morristown, and Won-Tien Tsang, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1977, Ser. No. 865,237
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **21 Claims**

1. A heterostructure junction laser comprising
means forming an optical resonator having an axis along which stimulated radiation of said laser propagates,
first and second wide bandgap semiconductor cladding layers of opposite conductivity types,
a narrower bandgap semiconductor active region disposed between and contiguous with said cladding layers, and
electrode means for forward biasing said cladding layers so as to injcct minority carriers into said active region and for applying pumping current to said active region in excess of the lasing threshold, thereby to cause said active region to emit said radiation along said resonator axis, characterized in that said active region includes
a waveguide layer having a bandgap smaller than that of said cladding layers, and
an active layer, wherein said radiation is generated, having the shape of a narrow strip extending along said resonator axis, said active layer being contiguous with and optically coupled to said waveguide layer,



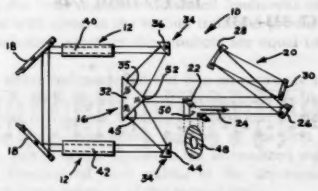
said active layer having a bandgap smaller than that of said waveguide layer and being adapted so that the difference in bandgap between said waveguide and active layers is, on the one hand, sufficiently large to confine said minority carriers to said active layer and, on the other hand, small enough to enable a significant portion of said radiation to penetrate into said waveguide layer.

4,190,814

SINGLE AXIS RESONATOR FOR LASER

John A. Van Workum, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 1, 1978, Ser. No. 882,525
Int. Cl.[2] H01S *3/081*
U.S. Cl. 331—94.5 C **8 Claims**

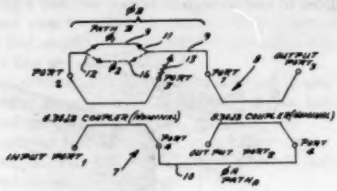


1. In a laser having an annular gain region and a resonator, the improvement therein residing in said resonator, said resonator comprising means for expanding a beam of radiant energy which impinges thereon and reflecting said expanded beam of radiant energy therefrom, means in optical alignment with said expanding and reflecting means and said gain medium for altering the shape of said expanded beam, relecting said altered beam through said gain medium, reconstructing said altered beam to said expanded shape and reflecting said expanded beam therefrom, and means in optical alignment with said shape altering and reflecting means for receiving said expanded beam therefrom, reflecting a portion of said beam out of said laser and directing the remainder of said beam back to said expanding and reflecting means, the optical axis of said resonator passing through the center of said receiving and reflecting means.

4,190,815
HIGH POWER HYBRID SWITCH

Victor J. Albanese, Valley Stream, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1978, Ser. No. 884,882
Int. Cl.[2] H01P 1/12
U.S. Cl. 333—101 8 Claims



1. A high power hybrid switch comprising

first and second directional couplers,

first and second transmission line circuits connecting said first and second directional couplers in tandem to form a 3dB hybrid, and

phase shift means selectively insertable into said first transmission line circuit.

4,190,816
DIVIDER NETWORK

Gerald E. Moss, Hull, and Everett E. Stevens, Manotick, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

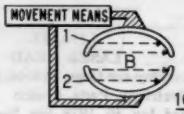
Filed Jan. 16, 1978, Ser. No. 870,015
Claims priority, application Canada, Feb. 11, 1977, 271563
Int. Cl.[2] H03H 7/48
U.S. Cl. 333—131 6 Claims

1. A divider network for dividing an HF signal into n output signals of the same power and phase, where n is a positive integer greater than 1, wherein each of said n signals is fed to an output port, each said output port having associated therewith a transformer, each said output port being connected to ground via at least one winding of said transformer, each output port being connected to a common point by a winding of said transformer so that each transformer is connected in parallel with respect to said common point; said HF signal being fed to said divider via an input port, said input port being connected to said common point and said common point being connected to the output port transformer by means providing a path length between said input port and each of said output ports which is substantially equal, said common point being connected to said input port via one winding of another transformer, said common point also being connected to ground by at least one other winding of said another transformer.

4,190,817
PERSISTENT CURRENT SUPERCONDUCTING METHOD AND APPARATUS

Mario Rabinowitz, 715 Lakemead Way, Redwood City, Calif. 94062

Filed Feb. 9, 1977, Ser. No. 767,139
Int. Cl.[2] H01F 7/22
U.S. Cl. 335—216 30 Claims

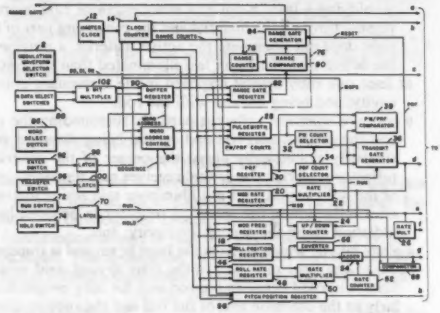


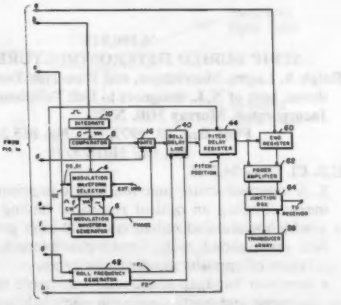
1. A magnetic device comprising: superconducting wall segments; a trapped non-solenoidal magnetic field; means mounting said wall segments at variable spaced apart locations and including structure permitting at least one of the wall segments to move along a preselected path as the spacing between said wall segments is changed to vary the said trapped magnetic field.

4,190,818
DIGITAL BEAMSTEERING FOR A PARAMETRIC SCANNING SONAR SYSTEM

James W. Follin, Rockville, and Robert E. Miller, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1977, Ser. No. 827,652
Int. Cl.[2] G01S 9/66
U.S. Cl. 367—138 24 Claims





1. A parametric scanning sonar system which generates a desired pattern of ensonification in a fluid medium comprising:

transducer means for producing sonar waves,

means for driving the transducer means, said driving means comprising:

a source of continuous wave energy comprising a selected modulation waveform generator and a carrier waveform generator, and

means, connected to the source, for appropriately switching the energy from the source on and off, said switching means comprising a comparator means for receiving waveforms from the modulation waveform generator and the carrier waveform generator as inputs and for producing a pulse duration modulation composite transducer drive output when the magnitude of the carrier waveform exceeds the magnitude of the modulation waveform, and

means for thereafter entering the composite transducer drive output waveform into the transducer means which transforms the composite transducer drive output into a sonar beam.

4,190,819

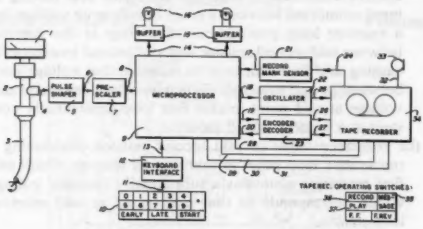
MOTOR VEHICLE AUDIO INFORMATION SYSTEM

Lajos Burgyan, Mountain View, Calif., assignor to Michael J. Femal, Arlington Heights, Ill., a part interest

Filed Jan. 31, 1977, Ser. No. 763,883

Int. Cl.[2] G08G *1/12*; G11B *5/00*; G06F *15/50*

U.S. Cl. 340—23 **7 Claims**



7. A method for delivering prerecorded messages concerning road information and the like at predetermined intervals related to the distance a motor vehicle travels, comprising the steps of:

utilizing a tape recorder in conjunction with an arithmetic and logic functioning microprocessor;

generating pulses that are proportional to the distance traveled by the vehicle;

accumulating the generated pulses in the microprocessor;

programming the microprocessor with preselected distance data related to each of the prerecorded messages;

dividing the accumulated pulses by pulses per a measurement of distance resulting in a quotient;

comparing the quotient with one of the preselected distances stored in the microprocessor to produce an output signal that drives the tape recorder to deliver one of the prerecorded messages related to the compared distance whenever the quotient is approximately equal to the preselected distance; and

sensing a recordmark on the tape after each prerecorded message for stopping the playback of the tape recorder until the next quotient is equal to the next preselected distance in the microprocessor, wherein the tape includes a format comprising a first distance data, the recordmark, a first message, a second distance data, the recordmark, a second message and so on in that order until the nth message on the tape is reach followed by the recordmark for stopping the playback of the tape recorder and in which the distance data on the tape programs the microprocessor with its preselected distance data related to each of the prerecorded messages.

4,190,820

SIGNAL TRAIN VERIFICATION SYSTEM USING LANDMARKS

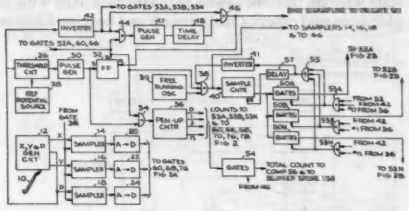
Hewitt D. Crane, Portola Valley, and Daniel E. Wolf, Menlo Park, both of Calif., assignors to Stanford Research Institute International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 716,344, Aug. 20, 1976, Pat. No. 4,086,567. This application Apr. 21, 1978, Ser. No. 898,997

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 SG **12 Claims**



1. In a system wherein a first train of signals having landmarks is to be correlated with a second train of signals having analogous landmarks, the method of segmenting each train of signals into segments and normalizing corresponding segments, the steps comprising:

segmenting the first train of signals into segments, including a first segment which includes the signals from the start of said first train to the first landmark, and a last segment which includes the signals from the last landmark to the end of said first train;

storing the signals in each segment of said first train;

counting the number of landmarks in said first train;

segmenting the second train of signals into segments including a first segment which includes the signals from the start of said second train to the first landmark thereof, and a last segment which includes the signals from the last landmark to the end of said second train;

storing the signals in each segment of said second train;

counting the number of landmarks in said second train;

comparing the total number of counted landmarks in said first train with those in the second train and producing a signal indicative whether the numbers are equal or not; and

when said signal indicates that the two numbers are equal, normalizing each segment of said second train by varying the number of signals therein to equal the number of signals in the corresponding segment of the first train, with the values of the signals in the normalized segment being a function of their values in the corresponding non-normalized segment of the second train.

4,190,821

SELF-HEALING LOOP COMMUNICATIONS SYSTEM

Thomas R. Woodward, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1978, Ser. No. 947,854

Int. Cl.[2] H04Q *9/00*; H04J *3/14*

U.S. Cl. 340—147 SC **24 Claims**

1. A self-healing loop communications system comprising:

a primary closed loop unidirectional transmission line for transmitting signals in a first direction;

a back-up closed loop unidirectional transmission line for transmitting signals in a second direction opposite to said first direction;

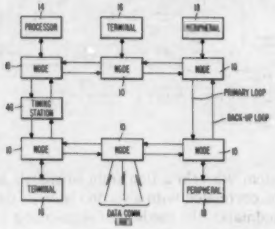
first means coupled to said primary and back-up lines for providing on one of said primary and back-up lines a serial data stream in a self-clocking code and further for provid-

ing on said other of said primary and back-up lines a stream of self-clocking idle data; and

a plurality of loop interface units coupled to said primary and back-up lines, each of said loop interface units including

second means connected to said one of said primary and back-up lines for detecting a first fault in said one of said primary and back-up lines,

third means connected to said other of said primary and back-up lines and said second means and responsive to said second means for switching between a first state wherein that one of said loop interface units is coupled to said other of said primary and back-up lines and a second state wherein that one of said loop interface units is uncoupled from said other of said primary and back-up lines, and



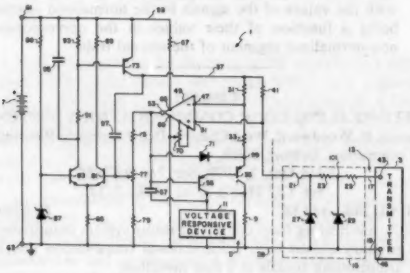
fourth means connected to said one of said primary and back-up lines and said second and third means and responsive to said second means for switching between a third state wherein that one of said loop interface units is coupled to said one of said primary and back-up lines and a fourth state wherein that one of said loop interface units is uncoupled from said one of said primary and back-up lines and said primary and back-up lines are interconnected and transferring said signals on said back-up and primary lines to the other of said back-up and primary lines, said primary and back-up lines thereby cooperating to provide a first new closed loop unidirectional transmission line to bypass said first fault.

4,190,822

CURRENT TELEMETERING INTERFACE APPARATUS

Richard Swarbrick, Glasgow, Scotland, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 5, 1978, Ser. No. 893,665
Int. Cl.[2] G08C *19/00*; G05F *1/10*
U.S. Cl. 340—210 **7 Claims**



6. Interface apparatus for use with a current receiver which is connected to a current transmitter by a two-wire link and an intrinsic safety barrier, said apparatus comprising

first and second terminals arranged to be connected to a source of current,

first and second transistors, each having a pair of principle electrodes and a control electrode,

first, second, and third resistors,

means connecting one of the principle electrodes of said first transistor to said first terminal,

means connecting said first resistor, said second resistor, and the principle electrodes of said second transistor in series with a current receiver, in the order stated, between the other of said principle electrodes of said first transistor and said second terminal to provide a first current loop wherein a current flows with a value controlled by said second transistor,

means connecting said third resistor, an intrinsic safety barrier, a two-wire link, and a current transmitter in series, in the order stated, between said other principle electrode of said first transistor and said second terminal to provide a second current loop wherein a current flows with a value controlled by said transmitter in accordance with the value of a condition sensed by said transmitter,

first amplifier means having an output connected to the control electrode of said second transistor and having an input connected between the junction between said first and second resistors and the junction between said third resistor and said barrier for causing said second transistor to adjust the value of said current in said first loop to maintain a predetermined ratio between the values of said loop currents, and

second amplifier means having an output connected to the control electrode of said first transistor and having an input connected between a point of reference voltage and a receiver loop point in said first loop at the junction between said second resistor and said second transistor for causing said first transistor to maintain that voltage drop between its said principle electrodes which maintains said voltage at said point in said first loop substantially constant at a predetermined value,

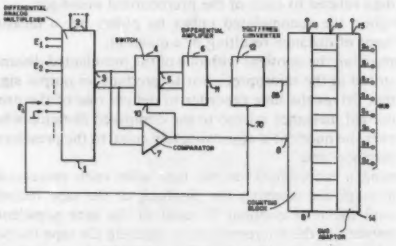
the resistance value of said second resistor establishing a transmitter loop point in said second loop at which said first transistor maintains a substantially constant voltage which corresponds to that maintained at said receiver loop point.

4,190,823

INTERFACE UNIT FOR USE BETWEEN ANALOG SENSORS AND A MICROPROCESSOR

Claude Leichle, Le Pecq, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 10, 1978, Ser. No. 868,448
Claims priority, application France, Jan. 11, 1977, 77 00560
Int. Cl.[2] H03K *13/20*; G06F *15/20*
U.S. Cl. 340—347 NT **9 Claims**



1. An interface circuit of the type for use between variable voltage analog sensors measuring physical magnitudes and a microprocessor for digital processing of the latter, said interface circuit comprising: an analog multiplexer connected to said sensors to select the output signals of the latter, an analog-to-digital converter including a voltage/frequency converter responsive to the output signals of said analog multiplexer and

a counter for converting said frequency into digital data, and a bus adapter being provided for delivering corresponding digital data to the microprocessor, wherein said analog multiplexer comprises a differential analog multiplexer having two differential voltage outputs, and having a sign detector connected to the differential voltage outputs of said multiplexer, a switching block is interconnected between said differential voltage outputs of said multiplexer and said voltage/frequency converter, said switching block being connected to the output of said sign detector so as to act as a selector circuit transmitting each voltage output signal of said multiplexer with a constant sign to the voltage/frequency converter, and said counter being an up/down counter resettable to an intermediate value, whose up/down counting input is connected to said sign detector output for counting up or down depending on said sign detector output.

4,190,824

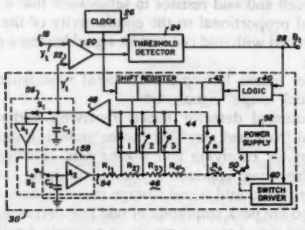
DATA TRANSMISSION SYSTEM USING A SEQUENTIAL APPROXIMATION ENCODING AND DECODING TECHNIQUE

Donald R. Weber, Saratoga, Fla., assignor to Rapicom, Inc., Fairfield, N.J.

Division of Ser. No. 645,604, Dec. 31, 1975, Pat. No. 4,107,610, which is a continuation of Ser. No. 342,854, Mar. 19, 1973, abandoned, which is a continuation of Ser. No. 66,459, Aug. 24, 1970, abandoned. This application Jun. 12, 1978, Ser. No. 914,334

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD **9 Claims**



1. In an encoding and decoding system including; an encoding means for developing an encoded signal in response to an input signal, a decoding means for developing an output signal in response to said encoded signal, and a data linking means for transferring said encoded signal from said encoding means to said decoding means, an improved encoding means comprising:

comparator means responsive to said input signal and a feedback signal for developing an error signal commensurate with the relationship between said input signal and said feedback signal;

detecting means responsive to said error signal for developing said encoded signal;

means for developing a cross-over control signal in response to said error signal indicating a cross-over of said feedback signal and said input signal;

adaptive function generating means responsive to said encoded signal for developing said feedback signal, said feedback signal being comprised of the summation of a base signal component and a changeable reference signal component; and

said function generating means including, voltage divider means for developing said base signal component by recirculating a sample of said feedback signal within the function generating means, which sample occurs in response to derivation of said cross-over signal, and forming the next feedback signal by sequentially dividing down the sampled signal and adding to said sampled signal a positive or negative divided down reference signal, the polarity of said reference signal changing with each cross-over signal.

4,190,825

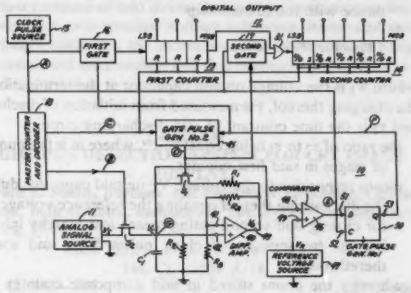
LOGARITHMIC ANALOG-TO-DIGITAL CONVERTER

Robert P. DePuy, Cherry Hill, N.J., and Arthur H. Leitten, Jr., Syracuse, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,188

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 AD **2 Claims**



1. A converter for converting an analog signal sample into a binary number corresponding to a logarithm of the analog signal sample comprising

a source of clock pulses,

a first binary counter of m stages, said first counter counting in one direction in response to clocking pulses applied to the input thereof,

a second binary counter of n stages, said second counter being controllable to count in said one and the opposite direction in response to pulses applied to the input thereof,

said first counter and said second counter constituting a composite counter of m+n stages in which the most significant stage of said first counter is coupled to the least significant stage of said second counter, and in which the least significant stage of said first counter is the least significant stage of said composite counter and the most significant stage of said second counter is the most significant stage of said composite counter,

a first gating means for controlling the transmission of clock pulses from said source of clock pulses to said first counter,

a second gating means for controlling the transmission of clock pulses from said source of clock pulses to said second counter,

a capacitor,

a source of reference voltage V_R,

means for providing said capacitor with a voltage equal to the amplitude V_S of said analog signal sample,

means responsive to a pulse from said source of clock pulses for initiating the charging of said capacitor through a charging circuit toward said reference voltage,

said charging circuit charging said capacitor in accordance with the relationship

$$V_C = V_S e^{t/\tau_1}$$

where V_C is the voltage on said capacitor, t is time measured from the occurrence of said pulse, and τ_1 is the time constant of said charging circuit,

counter controlling means responsive to said pulse for presetting the stages of said second counter, for controlling said second counter to count in said opposite direction, for opening said second gating means to allow transmission of

clock pulses therethrough to said second counter, and for presetting the stages of said first counter,

means responsive to the pulse from said source occurring after the voltage V_C on said capacitor exceeds said reference voltage V_R for terminating the charging of said capacitor by said charging circuit, for closing said second gate means and thereby inhibiting the transmission of clock pulses from said souce therethrough, for opening said first gating means to allow transmission of clock pulses therethrough, and for initiating the discharge of said capacitor through a discharging circuit, and for controlling said second counter to count in said one direction,

said discharging circuit discharging said capacitor in accordance with the relationship

$$V_C = V_1 e^{-t/\tau_2},$$

where V_1 is the voltage on said capacitor at the termination of the charging thereof, t is measured from initiation of discharge and τ_2 is the time constant of said discharging circuit,

the ratio of τ_2 to τ_1 being equal to 2^m, where m is the number of stages in said first counter,

means responsive to the voltage V_C on said capacitor during the discharging thereof equaling the reference voltage V_R for closing said second gating means and thereby inhibiting the transmission of clock pulses from said source therethrough,

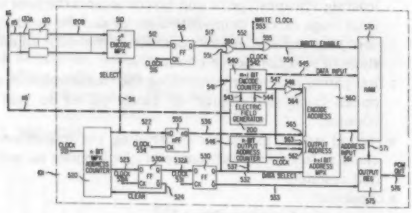
whereby the count stored in said composite counter is a number corresponding to the logarithm of said analog signal sample.

4,190,826

MULTIDEVICE POSITION DIGITAL ENCODER

Harold G. Alles, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 18, 1977, Ser. No. 798,161
Int. Cl.[2] G06F *3/02*; G10H *1/00*
U.S. Cl. 340—365 S **17 Claims**



11. An arrangement for generating signals responsive to the position locations of many independently movable devices, comprising

means for generating a time-varying electric field wave which propagates in one direction along a first path at a controlled rate during a predetermined interval of time,

plural coupling devices mechanically coupled to separate respectively associated movable devices, which coupling devices are capable of movement along respective paths which are parallel and adjacent to the first path as the respective movable devices are moved, each coupling device being capable of receiving an electric signal from the elecric field wave, and

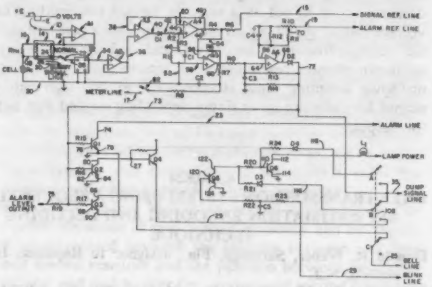
means capable of generating signals responsive to the position of each coupling device during the predetermined interval of time relative to the time-varying electric field.

4,190,827

MULTICHANNEL SALINITY METER

Joseph M. Diamond, Brooklyn, N.Y., assignor to McNab, Incorporated, Mount Vernon, N.Y.

Continuation of Ser. No. 687,613, May 18, 1976, abandoned.
This application Sep. 19, 1978, Ser. No. 943,801
Int. Cl.[2] G08B *23/00*; G01N *27/42*; G01R *27/02*
U.S. Cl. 340—500 **9 Claims**



1. A circuit for monitoring the salinity of a solution comprising

a conductivity cell;

a temperature compensating resistor connected in series with said cell;

signal source means supplying a semi-square-wave signal to said cell and said resistor in series such that a cell output signal proportional to the conductivity of the solution is produced with said cell output signal having a peak amplitude;

amplifier means having a high input impedance receiving said cell output signal; and

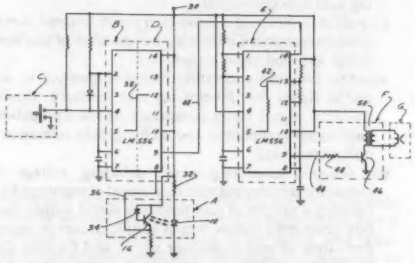
peak actuated detector means receiving said cell output signal from said amplifier means including signal storage means for receiving and storing said cell output signal, unidirectional conducting means supplying said cell output signal to said signal storage means and means responsive to the peak amplitude of said cell output signal stored by said signal storage means to generate a salinity signal proportional to the conductivity of the solution whereby said salinity ssignal is substantially unaffected by stray capacitance due to the use of said semi-square-wave signal and said peak actuated detector means.

4,190,828

MOVEMENT SENSITIVE ANTI-THEFT ALARM

Daniel H. Wolf, 370 River Rd., Bogota, N.J. 07603

Filed Jun. 19, 1978, Ser. No. 916,472
Int. Cl.[2] G08B *13/14*
U.S. Cl. 340—571 **12 Claims**



1. An alarm for preventing theft of a movable article com-

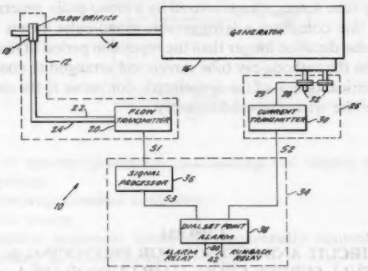
prising movement sensitive trigger means and means operably connected to said trigger means effective, when actuated thereby, to generate an alarm signal, said trigger means comprising a support, photosensitive signal generating means mounted on said support, light generating means and means for suspending said light generating means from said support in opposing spaced relationship with said photosensitive means, said light generating means and photosensitive means being normally substantially aligned, said photosensitive signal generating means actuating said alarm signal generating means upon substantial misalignment between said light generating means and said photosensitive signal generating means.

4,190,829

CURRENT/FLOW COMPARATOR

Nickolas Schmitt; Sterling C. Barton, both of Scotia, and Lawrence E. Jordan, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1978, Ser. No. 942,478
Int. Cl.[2] G08B *19/00*; H02K *9/24*
U.S. Cl. 340—606 **9 Claims**



1. A current/flow comparator for generating an alarm signal whenever the instantaneous flow rate of a coolant liquid cooling the armature of a dynamoelectric machine falls below a predetermined percentage of a desired instantaneous flow rate, which desired instantaneous flow rate varies as the square of the actual instantaneous current flowing through said armature, said comparator comprising:

means for generating a first signal representative of the actual instantaneous value of said flow rate;

means for generating a second signal representative of the actual instantaneous value of said armature current; and

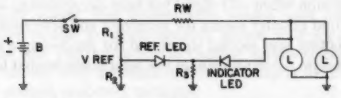
means responsive to said first and second signals for generating an alarm signal whenever said instantaneous flow rate falls below said desired instantaneous flow rate by more than said predetermined percentage.

4,190,830

LAMP OUTAGE INDICATOR CIRCUIT

Robert E. Bell, Harper Woods, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 779,662, Mar. 21, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,935
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—642 **4 Claims**



1. A lamp outage indicator for an incandescent lighting system having a source of direct current, a first resistance of relatively small value and a first incandescent lamp connected in series across said source, which comprises:

a voltage divider network comprising a second resistance and a third resistance connected across said source of direct current;

a first two terminal voltage sensitive indicator device and a fourth resistance connected in series, with the free terminal of the said first voltage sensitive indicator connected intermediate said second and third resistances, and the free terminal of the said fourth resistance connected in common with the incandescent lamp and the source of direct current; and

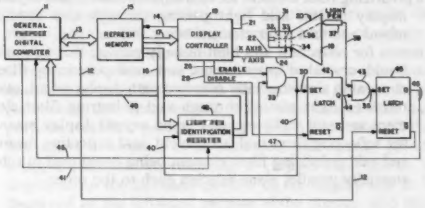
a second two terminal voltage sensitive indicator device, the first terminal of said device being connected intermediate said first two terminal voltage indicating device and said fourth resistance, the second terminal of said device being connected intermediate said first resistance and said incandescent lamp.

4,190,831

LIGHT PEN DETECTION SYSTEM FOR CRT IMAGE DISPLAY

Howard L. Stahle, Burbank, and Norman R. Grossman, Canoga Park, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed May 8, 1978, Ser. No. 904,119
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—707 **10 Claims**



1. A display system comprising:

a cathode ray tube having an intensity control input for an electron beam therein and having a sweep control input for deflecting said electron beam across a screen of said cathode ray tube to produce at least one luminous trace thereon;

a light pen positionable adjacent to a trace on said screen for picking up at least one light pulse from a displayed trace and producing an electrical output signal indicative thereof;

computing means including a memory for storing a plurality of code words that identify the different components of an image to be traced on said screen and for storing an identification code that identifies at least some of said code words;

display control means coupled between said computing means and said inputs to said cathode ray tube;

said display control means adapted to sequentially receive said code words from said memory and in response thereto to provide signals to said intensity control input and said sweep control input to cause the image, or portion thereof, identified by said code words to be traced on said screen of said cathode ray tube;

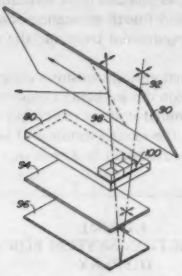
a register coupled to said memory and adapted to receive a said identification code as a said code word indicative of an image, or portion thereof, to be traced is transferred into said display control means; and

transfer means coupled to said computing means and responsive to said light pen output signal for enabling a said identifying code in said register to be transferred to said computing means.

4,190,832
POLARIZED WINDSHIELD INDICIA REFLECTION DISPLAY SYSTEM

Sailor Mohler, 5410 Lightning View, Columbia, Md. 21044

Filed Apr. 18, 1978, Ser. No. 897,251
Int. Cl.[2] G09F 9/32
U.S. Cl. 340—705 17 Claims

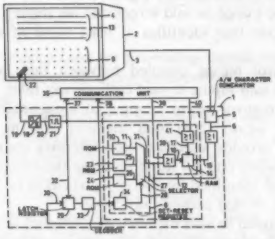


1. A windshield indicia display system comprising:
multi-segment liquid crystal display means positionally located adjacent said windshield in a manner allowing external light to pass through said windshield for impingement upon and through said liquid crystal display means;
a polarizing filter element located adjacent said liquid crystal display means, said light passing through said display means and said filter element being filtered; and,
means for reflecting said light initially passing through said liquid crystal display means and said polarizing filter element in a substantially reversed path displacement, said reflected light passing through said polarizing filter element and said multi-segment liquid crystal display means for reflection from said windshield, said reflecting means and said polarizing filter element being positioned in substantially parallel plane relation each to the other.

4,190,833
ALPHANUMERIC TERMINAL HAVING AN OPTOELECTRIC CONVERTER AND AN ASSOCIATED MONO-PULSE GENERATING CIRCUIT

Anders M. T. Bejting, 39 Vilans Väg, Danderyd, Sweden (S-182 35), and Lars Å. Wern, 65 Upplandsgatan, Stockholm, Sweden (S-113 28)

Filed Feb. 6, 1978, Ser. No. 875,658
Claims priority, application Sweden, Feb. 18, 1977, 7701861
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—707 1 Claim

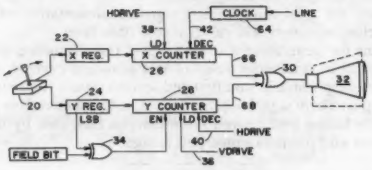


1. An alphanumeric terminal, comprising a text generator and a display unit with a signal input connected to the text generator and a cathode-ray tube screen arranged to display a plurality of lines with an alphanumeric information generated by an intensity modulation of a line raster on the cathode-ray tube screen in correspondence to a digitally coded information stored in the text generator, the text generator comprising an alphanumeric character generator with a data input and a test memory arranged to store the digitally coded information for generating said lines with alphanumeric information and connected to the data input of the character generator, the text memory in the text generator being divided into (a) a read memory that has a memory content arranged to produce a reproduction of an alphanumeric character set on a first portion of the cathode-ray tube screen and having a read output connected to the data input of the character generator and (b) a write-and-read memory that is arranged for a reproduction of an alphanumeric text on a second portion of the cathode-ray tube screen and having a read output connected to the data input of the character generator, a write input connected to the read output of the read memory and an enable input arranged to provide a writing operation via the write input, and the text generator further comprising an optoelectric converter with an optical input and an electrical output and a light transferring means that is connected to the optical input of the optoelectric converter and is arranged to be movable over the cathode-ray tube screen in order to be placed upon selected characters in the character set reproduced on said first portion of the cathode-ray tube screen, characterized by a mono-pulse generating circuit that comprises a retriggerable mono-pulse means having a pulse duration longer than the repetition period of the line raster on the cathode-ray tube screen and arranged to connect the electrical output of the optoelectric converter to the enable input of the write-and-read memory.

4,190,834
CIRCUIT AND METHOD FOR PRODUCING A FULL-SCREEN CROSS-HAIR CURSOR ON A RASTER-SCAN TYPE DISPLAY

Douglas J. Doornink, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 16, 1978, Ser. No. 951,703
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—709 12 Claims



1. A circuit for producing a full-screen cross-hair cursor in a display system including a display screen and means for producing a raster-scan image thereon, said circuit comprising:
(a) positional means for producing first and second digital signals representative respectively of first and second coordinate values of a desired location on said screen of a cursor to be produced;
(b) first counter means for receiving and selectively decrementing said first digital signal and for producing a first indication when said signal has been decremented to zero;
(c) second counter means for receiving and selectively decrementing said second signal and for producing a second indication when said signal has been decremented to zero; and
(d) means responsive to said first and second indications for producing an illuminated spot on the screen of said display system whenever either, but not both, of said digital signals have been decremented to zero.

4,190,835

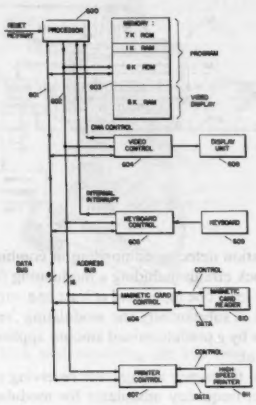
EDITING DISPLAY SYSTEM WITH DUAL CURSORS

William J. Buynak, Bayville, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 725,642, Sep. 22, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,372

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—750 **4 Claims**



1. A microprogrammable text editing and display system comprising:

a microprogrammable controller;

a clock source;

instruction sequencer means for sequentially controlling a plurality of controller operations;

program counting means for counting program steps, said program counting means including means for storing program steps;

instruction register means for storing an instruction word;

decoder means for decoding the operation called for in the instruction stored in said instruction register;

said sequencer means including a control read-only memory having an output for generating a group of sequentially controlled signals;

means coupling said decoder means to said output of said control read-only memory dependent upon the operation called for by the instruction in said instruction register;

accumulator means;

memory means;

input-output control means for coupling data from peripheral circuitry to said controller;

bus means having input means coupled to the outputs of said instruction register, said program counter and said memory means, said accumulator means and said input-output control means;

said bus means including output means and multiplexer means for selecting the input to be passed to the output means of said bus means;

means coupling said instruction sequencer to said bus means multiplexer for selecting the input to be passed by the output of said common bus means;

means coupled to said instruction sequencer means for selectively coupling the output of said bus means to one of said memory means, said accumulator means, said instruction register means, program counter means, said accumulator means and said input-output control means selectively in accordance with the sequential control signal developed by said control read-only memory;

an address register connected to said input means of said bus means for specifying a predetermined location in said memory means;

said text editing and display system further comprising:

a random access memory;

means for storing characters pertaining to a predetermined line to be displayed in a predetermined portion of said random access memory;

means for storing a cursor location pertaining to said predetermined line a a predetermined portion of said random access memory;

means for providing access to said random access memory for reading out said stored characters and said cursor location;

a display unit connected to said means for providing access, and having a display for displaying said stored characters along lines on said display;

means connected to said means for providing access for generating at least two visible markers in predetermined locations on said display corresponding to said stored cursor location;

means for generating variable margin and tab indices on said display;

at least one of said visible markers being displayed on one of said row lines of said display where said tab indices are displayed;

the line count of said predetermined line storing one of said cursor locations being displayed on said display;

said display means having a plurality of character row lines in which images of data characters may be displayed, each of the character rows including a right-hand border character and a left-hand border character;

video control means connected to said display means for supplying signals representing characters to be displayed in said character rows, including means for generating a cursor on each of said character rows;

means for storing representations of all characters to be displayed on one line including a representation of where a cursor is to be displayed on said one line; and

said random access memory partitioned into data sets corresponding to each line of said display, each data set being partitioned into first, second, third, fourth and fifth data portions; said first portion representing the location on that line where a cursor is to be activated; said second portion being a character representing a vertical rule line to be displayed on the left-hand portion of the display line to be displayed on the left-hand portion of the display; said third portion being a region of said line where blank characters may be introduced to define a specific margin point, said fourth portion being a region of said line wherein text entered by the user for display may be introduced, said fifth portion being a character representing a vertical rule line to be displayed on the right-hand portion of the display.

4,190,836

DYNAMIC DRIVE CIRCUIT FOR LIGHT-EMITTING DIODES

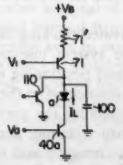
Hiroyuki Kimura, Yokohama; Isao Fukushima; Shin-Ichi Ohashi, both of Fujisawa, and Yoshinori Masuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 2, 1977, Ser. No. 847,802

Claims priority, application Japan, Nov. 15, 1976, 51/136293; Nov. 15, 1976, 51/136294

Int. Cl.[2] G09F *9/32*

U.S. Cl. 340—762 **20 Claims**



1. In a dynamic drive circuit for light-emitting diodes, comprising anode drive switching means connected with the an-

odes of said light-emitting diodes, cathode drive switching means connected with the cathodes of said light-emitting diodes, and a power source connected through said anode and cathode drive switching means with said light-emitting diodes, said anode and cathode drive switching means being repeatedly turned on and off in a time-division manner to drive said light-emitting diodes with a pulsed current in a time-division manner,

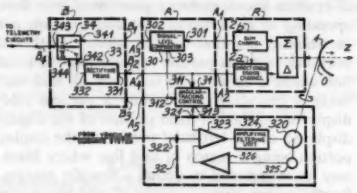
the improvement further comprising a time constant control means for delaying the rise time of pulses of the current flowing through said light-emitting diode to reduce higher harmonic components contained in the rising current portion of said pulses of current.

4,190,837

SYSTEM FOR PROTECTING A VEHICLE-BORNE TRACKING RADAR AGAINST AN OFF-TARGET JAMMER

Laurence Salvaudon, and Jean-Claude Charlot, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 16, 1978, Ser. No. 915,983
Claims priority, application France, Jun. 17, 1977, 77 18621
Int. Cl.[2] G01S *9/22, 7/36*
U.S. Cl. 343—16 M **12 Claims**



1. In a vehicle-borne tracking radar including telemetric circuitry associated with a vehicular guidance system for steering the vehicle toward a target, the radar being provided with an orientable directive antenna having an axis trainable by said guidance system upon the target in response to incoming echo signals,

the combination therewith of:

a receiver provided with a sum channel and a difference channel connected to said antenna, said difference channel emitting an error signal in the presence of radiation incoming in a direction deviating from said axis;

positioning means coupled with said antenna for rotating said axis in a predetermined plane;

switchover means for connecting said telemetric circuitry to an output of said sum channel in a normal position and to an output of said difference channel in an alternate position;

normally deactivated tracking-control means independent of said guidance system inserted between said difference channel and said positioning means; and

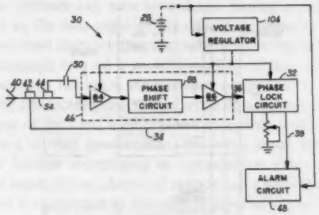
detector means connected to the output of one of said channels for ascertaining the presence of interfering signals from an off-target jammer and, in response to such interfering signals, changing said switchover means from said normal position to said alternate position while activating said tracking-control means to transmit an error signal from said difference channel to said positioning means, thereby training said axis upon said jammer.

4,190,838

RADIATION DETECTOR

James A. Kemp, Plano, Tex., assignor to R A Electronics, Inc., Richardson, Tex.

Filed Jul. 20, 1978, Ser. No. 926,509
Int. Cl.[2] G01S *7/40;* **H04B** *17/00*
U.S. Cl. 343—18 E **16 Claims**



1. A radiation detector comprising in combination:

a phase lock circuit including a modulating frequency oscillator, at least one input, and at least one output drivable by a signal of substantially the modulating frequency shifted in phase by a predetermined amount applied to the at least one input;

a radiation frequency antenna for receiving radiation;

a radiation frequency modulator for modulating the radiation received from the antenna with the modulating frequency received from the modulating frequency oscillator;

an envelope detector for detecting the modulated radiation envelope;

an amplifier-phase shift circuit coupled to the AC output of the envelope detector for amplifying and shifting the phase of the AC output of the envelope detector to the predetermined amount, wherein the at least one input of the phase lock circuit is responsive to the output of the amplifier-phase shift circuit; and

an alarm circuit for generating an alarm responsive to the phase lock circuit wherein an alarm is generated when a signal is present at the output of the amplifier-phase shift circuit whereby an alarm is generated when a radiation frequency signal is received by the radiation frequency antenna.

4,190,839

MOBILE ANTENNA INCLUDING QUICK-RELEASE MOUNTING

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,247
Int. Cl.[2] H01Q *1/32, 9/18*
U.S. Cl. 343—715 **23 Claims**

1. A mobile antenna for mounting to a body panel comprising, in combination:

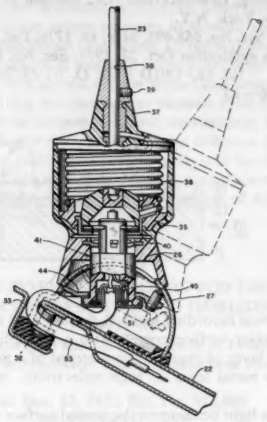
a radiating element;

a base member for supporting said radiating element in a substantially vertical position, said base member including a housing defining a socket, and

means comprising a mounting pin for mounting said base member to said body panel,

said mounting pin being adapted at one end for insertion into said socket and at the other end for securement to said body panel, said base member housing including a plurality of circumferentially spaced keyways adjacent said socket, with locking means between adjacent keyways, said pin including a first plurality of projecting tabs in mating relationship with said keyways whereby insertion

and twisting of said pin into said socket causes said tabs to pass through said keyways and engage said locking means



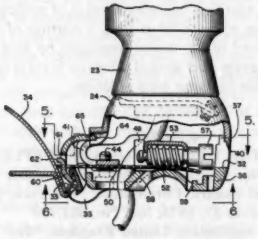
to axially lock said mounting pin and base member together.

4,190,840

ANTENNA MOUNTING ADAPTOR

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,234
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 **10 Claims**



1. An adaptor for mounting a mobile antenna on a vehicle gutter or the like, said adapter comprising:

a housing adapted to receive in mating engagement the base portion of the antenna;

fastener means for mounting said housing to the gutter including an elongated band having first and second ends, said housing including a sidewall with opening means in said sidewall, the first end of said band being received within said housing through said opening means;

user-adjustable means within said housing for engaging said first end of said band to draw said first end into said housing, said second end of said band including attachment means for positioning in the interior of said gutter;

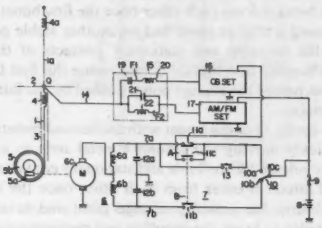
said sidewall further including a shoe for engagement with the underside of the gutter, whereupon adjustment of said user-adjustable means draws the housing and shoe tightly into engagement with said gutter.

4,190,841

CAR ANTENNA SYSTEM WITH BIMETALLIC CONTROL MEANS

Jiro Harada, Tokyo, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,811
Claims priority, application Japan, Dec. 27, 1977, 52-159241
Int. Cl.[2] H01Q *1/10*
U.S. Cl. 343—903 **9 Claims**



1. A car antenna system for driving an expansion type antenna element between fully expanded and fully contracted states, and for stopping the driving of the antenna element responsive only to the antenna element being in one of its fully expanded or fully contracted states, comprising:

an expansion-type antenna element having a driving end;

a driving wire having one end connected to the driving end of the antenna element;

a wire transfer mechanism for taking up and feeding the driving wire so as to contract and expand the antenna element;

a driving power supply circuit including a first power supply circuit having two terminals and a second power supply circuit having two terminals;

a motor selectively coupled to said first and second power supply circuits for driving the wire transfer mechanism to take up the driving wire when it is connected to the first power supply circuit and to feed the driving wire when it is connected to the second power supply circuit;

a first circuit breaker connected in series with the first power supply circuit and comprising a first stationary contact connected to one of the two terminals of the first power supply circuit and a first bimetal strip having a movable contact, the first bimetal strip being connected to the other terminal of the first power supply circuit, said first bimetal strip normally having the movable contact thereof kept in contact with the first stationary contact to thereby close the first power supply circuit and, when the antenna element expands fully and the motor which is connected to the first power supply circuit becomes unable to rotate, said first bimetal strip bends due to an over current flowing through it to thereby open the first power supply circuit;

a second circuit breaker circuit connected in series with the second power supply circuit and comprising a second stationary contact connected to one of the two terminals of the second power supply circuit and a second bimetal strip having a movable contact, the second bimetal strip being connected to the other terminal of the second power supply circuit, said second bimetal strip normally having the movable contact thereof kept in mutual contact with the second stationary contact to thereby close the second power supply circuit and, when the antenna element contracts fully and the motor which is connected to the second power supply circuit becomes unable to rotate, said second bimetal strip bends due to an over current flowing through it to thereby open the second power supply circuit, said first and second bimetal strips being so designed and arranged relative to each other as to be bent toward each other;

a common interlocking member associated with both the

first and second circuit breakers and disposed between the first and second bimetal strips for pushing one of the first and second bimetal strips until the movable contact of the pushed bimetal strip comes into contact with its corresponding stationary contact when the other bimetal strip is bent due to over current flowing through said other bimetal strip;

a first spring in engagement with the first bimetal strip for quickly moving the first bimetal strip to a stable point to release the movable and stationary contacts of the first circuit breaker from each other once the first bimetal strip has passed a change point and to another stable point to bring the movable and stationary contacts of the first circuit breaker into mutual contact once the first bimetal strip has passed the change point, pushed by the interlocking member;

a second spring in engagement with the second bimetal strip for quickly moving the second bimetal strip to a stable point to release the movable and stationary contacts of the second circuit breaker from each other once the second bimetal strip has passed a change point and to another stable point to bring the movable and stationary contacts of the second circuit breaker into mutual contact once the second bimetal strip has passed the change point, pushed by the interlocking member; and

a changeover switch for selectively connecting a power source alternatively to the first and second power supply circuits.

4,190,842

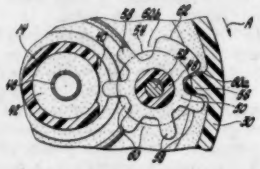
ANTENNA CABLE DRIVE AND STORAGE DRUM WITH STOP MECHANISM

David T. Carolus, and Ralph W. Edwards, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1978, Ser. No. 962,922

Int. Cl.[2] H01Q *1/10*

U.S. Cl. 343—903 **3 Claims**



1. An antenna cable drive comprising; a stationary housing; a reversible rotatable drive and storage drum mounted on said housing; means for rotating said drum; a cable drivingly connected to said drum and being stored thereon and being extended from and retracted into said housing by rotation of said drum in one direction or the other during a predetermined number of revolutions of said drum in each respective direction; and drum rotation responsive means including gear means rotatably mounted on said housing having a number of equally spaced teeth greater than the predetermined number and a single wide tooth, and a single tooth on said drum meshing in the spaces between said equally spaced teeth to rotate said gear means one tooth space for each revolution of said drum during said predetermined number of revolutions and abutting the outer surface of said single wide tooth if said drum rotates a number of revolutions greater than said predetermined number thereby restricting further rotation of said drum.

4,190,843

RECORDING METHODS FOR A MULTILAYER OPTICAL RECORD

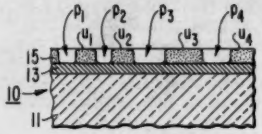
Fred W. Spong, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 668,495, Mar. 19, 1976, Pat. No. 4,097,895.

This application Oct. 28, 1977, Ser. No. 846,667

Int. Cl.[2] G01D *9/00, 15/10, 15/24*

U.S. Cl. 346—1.1 **6 Claims**



1. An optical recording method, for use with a record blank having a major surface coated with a multiplicity of layers including a layer of organic dye material of a given thickness overlying a metal layer of high reflectivity, comprising the steps of:

focusing a light beam upon the coated surface of said record blank; and

moving a succession of regions of said coated surface through the path of said focused light beam; while

causing the intensity of said focused light beam to alternate between first and second levels in accordance with information to be recorded;

wherein the light frequency of said focused beam is maintained at a frequency at which said dye layer exhibits significant absorptivity of such a magnitude that said dye and metal layers form a multilayer optical element exhibiting, for light of said frequency directed toward said metal layer via said dye layer, variations in reflectance versus dye layer thickness in accordance with a characteristic exhibiting a plurality of reflectance minimums at respective dye layer thickness values, with the lowest of said thickness values substantially equal to said given thickness; wherein said first intensity level is of sufficient magnitude to cause ablation of at least a portion of said dye layer in a record blank region impinged by said focused beam; and wherein said second intensity level is of insufficient magnitude to cause such ablation.

4,190,844

INK-JET PRINTER WITH PNEUMATIC DEFLECTOR

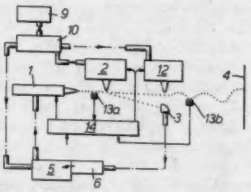
Terrence F. E. Taylor, Burgess Hill, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,708

Claims priority, application United Kingdom, Mar. 1, 1977, 08546/77

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **2 Claims**



1. An ink-jet printer comprising: a print-head including a droplet generator, a first droplet deflector, and a droplet catcher, said first droplet deflector being a controlled pneumatic jet so directed at the stream of droplets which issue from

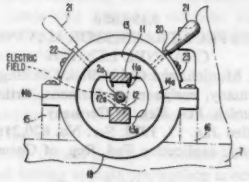
said droplet generator as to deflect said stream from a first path to at least one other path whereby to vary the marking effect of said stream on a record web; an ink source interconnected to the print-head to deliver ink to said droplet generator; a supply of air under pressure to actuate said droplet generator and said first droplet deflector; sensor elements to monitor the passage and position of said stream of droplets; a central control unit to coordinate the control of said first droplet deflector with the passage and position of said droplet stream and with selective input signals relating to characters or pictures to be marked on said web; a second droplet deflector downstream from said first droplet deflector said second droplet deflector deflecting those portions of said stream which reach it in an oscillatory manner, said first droplet deflector, when appropriately controlled by signals, determining what portions of said stream reach the second droplet deflector.

4,190,845

ELECTRIC FIELD ORIENTATION FOR INK JET PRINTERS FOR VERTICAL AND HORIZONTAL PRINTING

Leon M. Cooper, and Walter J. Wipke, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1978, Ser. No. 973,056
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—75 **25 Claims**



1. An ink jet printing system comprising:
a nozzle for issuing a stream of ink drops;
a first electrode for charging the ink drops issuing from said nozzle in accordance with signals to be recorded;
a record receiving medium for forming images indicative of the signals imposed upon said ink drops, means for forming an electric field, means for orientating said field substantially perpendicular to said stream of ink drops, said electric field for effecting deflection of said ink drops in accordance with the amplitudes on the individual charges on said ink drops;
means for effecting relative movement between said nozzle and said record receiving medium in at least a selected one of vertical and horizontal directions, and means coupled to said means for orienting said electric field to position said electric field orthogonally to said selected one of horizontal and vertical directions.

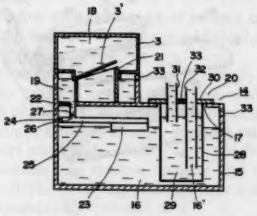
4,190,846

INK LIQUID CONCENTRATION CONTROL IN AN INK LIQUID SUPPLY SYSTEM FOR AN INK JET SYSTEM PRINTER

Yoichi Yamamoto, Nara, and Yoichi Shimazawa, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1977, Ser. No. 857,973
Claims priority, application Japan, Dec. 6, 1976, 51-147042
Int. Cl.[2] G01D *15/18*; G05D *11/00*
U.S. Cl. 346—140 R **8 Claims**

1. An ink liquid supply system for an ink jet system printer which emits ink droplets from a nozzle for performing a writing operation, said ink liquid supply system comprising:
an ink tank for containing ink liquid therein;
conduit means for connecting said ink tank with said nozzle;
a pump for supplying the ink liquid from said ink tank to said nozzle through said conduit means under a predetermined pressure; and
an ink liquid concentration controller disposed between said ink tank and said pump, said ink liquid concentration controller including:



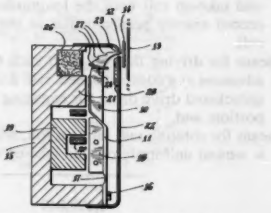
a first reservoir for containing reference ink of a predetermined concentration therein;
a second reservoir for introducing ink liquid from said ink tank and for supplying ink liquid to said pump; and
means for maintaining the concentration of the ink liquid in said second reservoir at a value identical with that of the reference ink in said first reservoir.

4,190,847

STRAY INK COLLECTOR FOR IMPACT PRINTER

Sven G. V. Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Nov. 6, 1978, Ser. No. 958,050
Claims priority, application Sweden, Nov. 9, 1977, 7712670
Int. Cl.[2] G01D *15/20*; B41J *9/00*
U.S. Cl. 346—141 **10 Claims**



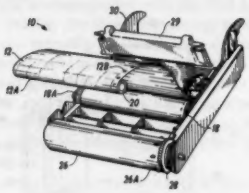
1. In a device for producing imprints on a recording medium, a member acting on said medium having an elongated arm for striking or pressing against a surface of said medium, a support having an impact surface, means mounting said arm for resilient pivotal movement on said support, an operating assembly for said device on said support, said arm, under the action of said operating assembly, being movable between a rear portion against said impact surface and a front position in which a portion of said arm strikes or presses against said medium which is the printing position, the cross-sectional area of said arm that is between the impact point and the part of the arm which coacts with said fixed impact surface being provided with at least one steep step.

4,190,848

INDUSTRIAL PROCESS RECORDER INCORPORATING IMPROVED ROLL CHART ASSEMBLY

John R. Curran, Attleboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 21, 1978, Ser. No. 879,301
Int. Cl.[2] G01D *15/00*
U.S. Cl. 346—145 4 Claims



1. An industrial process recording instrument of the type utilizing a moving chart record and comprising:

an elongate chassis to be mounted as part of a control room panel together with other instruments and having a front face for presenting to the control room operator a portion of the moving chart record on which at least one process variable is recorded during instrument operation;

said instrument being adapted to be mounted in said panel so as to accommodate ready pull-out of said chassis at least partially from the panel;

an elongate roll chart cassette within said chassis with at least one long side of the contained roll chart having a perforated edge portion and being disposed parallel to the longitudinal axis of said recording instrument;

means mounting said cassette within said instrument to provide for ready removal of the cassette while said instrument has been withdrawn at least partially from said control panel;

said cassette including chart record replacement means wherein in one place of said cassette a supply roll on which the bulk of said chart record is initially wound is located and in another place a take-up roll presecured to the lead end of said chart record is positioned such that when said cassette is mounted in said chassis said chart record replacement means is automatically ready to permit markings to be placed thereon during instrument operation;

said lead end of said chart record being fixedly presecured to said take-up roll with the longitudinal axis of said chart record exactly perpendicular to the axis of said take-up roll;

means for driving the roll chart such that the chart record advances at a constant speed, said drive means including a sprocketed drive drum for engaging said perforated edge portion; and,

means for rotating said take-up roll, whereby said roll chart is wound uniformly on said take-up roll.

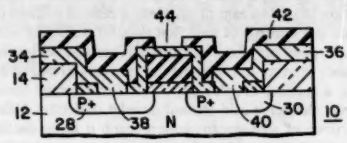
4,190,849

ELECTRONIC-BEAM PROGRAMMABLE SEMICONDUCTOR DEVICE STRUCTURE

Michael W. Powell, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1977, Ser. No. 834,081
Int. Cl.[2] H01L *29/78, 29/34, 27/10;* G11C *11/40*
U.S. Cl. 357—23 1 Claim

1. An integrated semiconductor device including an insulated gate field effect transistor capable of being selectively programmed by an electron beam for use in a memory array, said transistor comprising: an electrically isolated gate electrode overlying a gate insulator layer which overlies a semiconductor substrate of a first conductivity type and disposed spatially between a source region and a spaced apart drain region of opposite conductivity type which form a pair of PN junctions in said substrate; an insulator layer overlying said gate electrode and being of a thickness to allow penetration of electrons from an electron beam to said gate electrode; a region in said substrate underlying said gate electrode, positioned



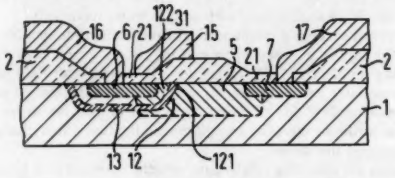
between said source and drain regions and having a conductive state responsive to electrons stored on said gate electrode from said electron beam; and means on said substrate for accurately positioning said electron beam with respect to said gate electrode.

4,190,850

MIS FIELD EFFECT TRANSISTOR HAVING A SHORT CHANNEL LENGTH

Jenõe Tihanyi, Munich, and Guido Bell, Gilching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 17, 1978, Ser. No. 870,216
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703877
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 18 Claims

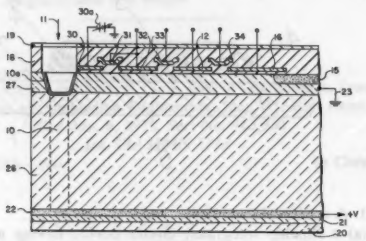


1. MIS field effect transistor having a short channel length with a semiconductor substrate, on the surface of which there is arranged an insulating layer, which is in turn provided with a gate electrode layer, wherein, in the semiconductor substrate there is provided a drain zone of the first conductivity type and a source zone which possesses the first conductivity type is strongly doped and meets the substrate surface, a second doped zone of the second conductivity type which lies below said source zone and surrounds said source zone at least in the direction of said drain zone, and meets the substrate surface spaced laterally with respect to said source zone by a third zone, a channel zone being formed by that portion of the semiconductor substrate which lies between the outer edge of said second doped zone adjoining the substrate surface and the adjacent edge of said source zone, and is located within said third zone of the first conductivity type, said third doped zone being lightly doped and adjoining said drain zone, source zone and said second doped zone containing implanted dopant particles.

4,190,851
MONOLITHIC EXTRINSIC SILICON INFRARED DETECTORS WITH CHARGE COUPLED DEVICE READOUT

Ronald M. Finnila, Costa Mesa, and Stephen C. Su, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 17, 1975, Ser. No. 614,277
Int. Cl.[2] H01L *27/14, 31/00*
U.S. Cl. 357—30 10 Claims



1. In an image detector of the type having at least one optical detector operable to generate an electrical charge signals in response to optical radiation, and having means for processing said signals comprising a charge coupled signal collecting device for transferring charge to a utilization circuit, the improvement comprising:

(a) a semiconductor substrate having an epitaxial layer monolithically formed thereon;

(b) an insulating layer of dielectric material formed on said epitaxial layer;

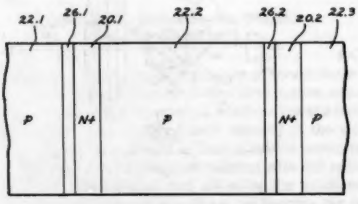
(c) at least one optical detector element formed in said substrate and having at least one surface accessible to optical radiation through an aperture extending through both said epitaxial layer and said insulating layer; and

(d) a plurality of electrode means spaced from said epitaxial layer by at least a portion of said insulating layer for forming said charge coupled signal processing device in said insulating and epitaxial layers to transfer signal charge from said detector element through said epitaxial layer to said utilization circuit in response to cyclical voltages applied to said electrode means to control the potential profile in said epitaxial layer.

4,190,852
PHOTOVOLTAIC SEMICONDUCTOR DEVICE AND METHOD OF MAKING SAME

Raymond M. Warner, Jr., 5001 Arden Ave., Minneapolis, Minn. 55424

Filed Sep. 14, 1978, Ser. No. 942,152
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 22 Claims



1. A photovoltaic semiconductor device having a plurality of photovoltaic semiconductor cells comprising:

a. relatively thick first horizontal layer of first conductivity material;

b. second horizontal layer of second conductivity material overlying said first horizontal layer of said first conductivity material;

c. third horizontal layer of first conductivity material overlying said second horizontal layer of said second conductivity material;

d. plurality of first elongate zones of second conductivity material extending entirely through said third, second, and first horizontal layers;

e. plurality of second elongate zones of heavily doped first conductivity material parallel and substantially contiguous to each of said first elongate zones of second conductivity material extending entirely through said third and second layers and at least slightly into said first layer;

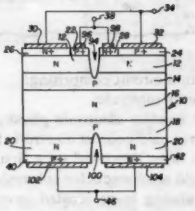
f. fourth horizontal thin shallow layer of said second conductivity material overlying said third horizontal layer of said first conductivity material, and;

g. metallization strips extending over a portion between each of said first and second elongate zones whereby topologically continuous active photovoltaic junctions are formed by said fourth and second horizontal layers and said first elongate zone of second conductivity material on the one, and said third and first horizontal layers and said second elongate zone of said first conductivity material on the other, with metallization strips extending over a portion between said first and second elongate zones, said metallization strips serially connecting each cell to an adjacent cell of said photovoltaic semiconductor device by short circuiting inactive pn junctions which bound one side of each cell, said inactive pn junctions being formed by said first elongate zone of second conductivity material on the one and by said second elongate zone of first conductivity material and said first horizontal layer on the other.

4,190,853
MULTILAYER SEMICONDUCTOR SWITCHING DEVICES

Jearld L. Hutson, 2019 W. Valley View La., Dallas, Tex. 75234

Continuation of Ser. No. 488,789, Jul. 15, 1974, abandoned. This application Sep. 20, 1976, Ser. No. 724,916
Int. Cl.[2] H01L *29/747*
U.S. Cl. 357—39 6 Claims



1. A semiconductor switch device having symmetrical bidirectional switching characteristics but nonsymmetrical construction comprising:

a body of semiconductor material having five layers of alternating first and second opposite conductivity types to form a plurality of P-N junctions, said body having two outer layers of said first conductivity type,

a pair of spaced apart heavily doped discrete regions of said second conductivity type being formed in portions of one of said outer layers to form a sixth layer defining an exterior surface of said body,

first isolating means extending through said one of said outer layers and disposed between said regions of said second conductivity type in order to electrically isolate said regions from one another,

first and second electrodes contacting said heavily doped regions,

third and fourth electrodes contacting said one outer layer of opposite sides of said first isolating means,

a heavily doped discrete region of said second conductivity type formed in and covering a portion of the other conductivity type formed in and covering a portion of the other of said outer layers to form a seventh layer defining another exterior surface of said body,

second isolating means extending through said other outer layer and disposed between said heavily doped region and the exterior surface of said other outer layer,

said body thus formed including one portion having six layer of alternating opposite conductivity types and a second portion having seven layers of alternating opposite conductivity types, said switch operable in response to electrical signals applied to said electrodes to provide bidirectional symmetrical switching action at a high commutating rate,

a fifth electrode contacting said heavily doped region in said other outer layer, and

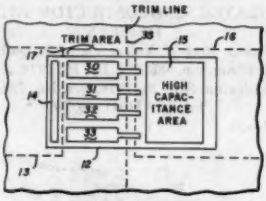
a sixth electrode contacting the exterior surface of said other outer layer on the opposite side of said second isolating means from said heavily doped region.

4,190,854

TRIM STRUCTURE FOR INTEGRATED CAPACITORS

Thomas P. Redfern, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 15, 1978, Ser. No. 877,915
Int. Cl.[2] H01L *27/00*
U.S. Cl. 357—51 **4 Claims**



1. An integrated circuit comprising:

a semiconductor substrate;

a conductive counter electrode physically associated with said substrate, said counter electrode being formed from a conductive layer deposited on a first insulating layer located on said semiconductor substrate;

a second insulating layer located over said counter electrode, said second insulating layer having a relatively thick region and a relatively thin region;

a first conductive electrode covering said thin region of said second insulating layer;

a second conductive electrode covering a portion of said thick region of said second insulating layer, said second conductive electrode being composed of a material selected from the group consisting of silicon-chromium alloy, molybdenum tungsten, tantalum, nickel-chromium alloy, niobium, and tantalum nitride;

means for connecting said first and second conductive electrodes; and

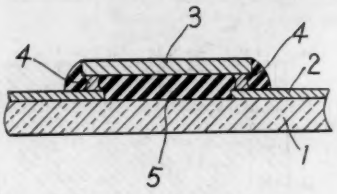
means for making electrical connection to said counter electrode and said first conductive electrode to create a capacitor the value of which can be laser trimmed without damaging said integrated circuit.

4,190,855

INSTALLATION OF A SEMICONDUCTOR CHIP ON A GLASS SUBSTRATE

Yukihiro Inoue, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1977, Ser. No. 823,455
Claims priority, application Japan, Aug. 11, 1976, 51/96365
Int. Cl.[2] H01L *39/02*
U.S. Cl. 357—80 **7 Claims**



1. A semiconductor device comprising:

(a) a flipchip integrated circuit device having a specific coefficient of thermal expansion;

(b) a mechanical supporting substrate which has a coefficient of thermal expansion substantially different from that of said flipchip and bears a low mechanical resistance against thermal expansion;

(c) a wiring pattern deposited on said supporting substrate;

(d) a bonding member for bounding said flipchip integrated circuit device and said substrate, said flipchip integrated circuit device being mechanically supported by the bonding member; and

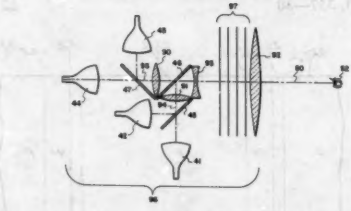
(e) an insulating resin layer deposited in such a manner so as to cover at least a junction between said flipchip integrated circuit device and said bonding member and a junction between said substrate and said bonding member, said insulating resin layer having a coefficient of thermal expansion sufficient to absorb mechanical strain caused by the differences in the coefficient of thermal expansion between said flipchip integrated circuit and said substrate, thereby ensuring the mechanical tightness of the junctions between said flipchip integrated circuit device and said bonding member and between said substrate and said bonding member against a substantial amount of thermal expansion.

4,190,856

THREE DIMENSIONAL TELEVISION SYSTEM

Dennis E. Ricks, 1166 Briar Ave., Provo, Utah 84601

Filed Nov. 21, 1977, Ser. No. 853,322
Int. Cl.[2] H04N *9/58*
U.S. Cl. 358—88 **30 Claims**



1. An apparatus for producing a three-dimensional picture suitable for use with television systems, said apparatus comprising:

(a) one or more display screens for displaying a set of cross-sectional representations of a scene,

(b) an arrangement of beam splitters for optically stacking said cross-sectional representations along a common optical axis to form a composite three-dimensional picture for viewing by an audience, and

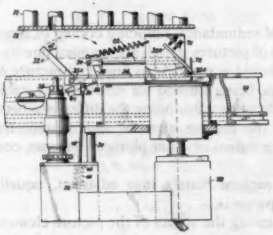
(c) at least one positive lens means for developing forward repositioning of the cross-sectional representations toward said audience, said lens means being positioned along said optical axis between said display screens and said audience and being separated from said display screens by an optical path distance that is greater than one focal length of said lens means.

4,190,857

PERISCOPE ASSEMBLY

Ronald B. Creek, and John P. Cook, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 8, 1978, Ser. No. 913,930
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—100 **10 Claims**



1. Apparatus for viewing the inside of tubes connected to an apertured tube sheet of a steam generator comprising track means adjacent the surface of the tube sheet, a viewing assembly including a television camera axially aligned with said tubes and mounted on said track for lateral movement relative to the surface of the tube sheet, a periscopic viewing device for said camera having a viewing mirror and an objective mirror mounted on said track to provide a line of sight between the viewing mirror and the objective mirror that is substantially parallel to said track, a tool holder mounted on said track in alignment with the objective mirror and adapted to be moved in a path normal to the line of sight between the objective and viewing mirrors, and means for moving the objective lens of the periscopic viewing device from the path of movement of the vertical tool holder thereby permitting unrestricted movement of the tool holder.

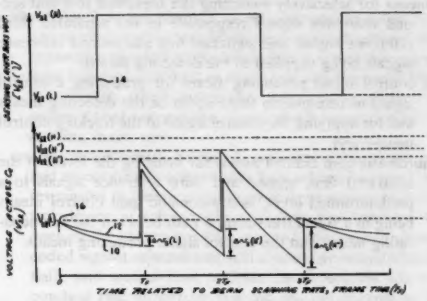
4,190,858

METHOD FOR IMPROVED PERFORMANCE OF INFRARED VIDICON CAMERAS

Edward F. Cross, Los Angeles, and Wilbur A. Garber, San Pedro, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1978, Ser. No. 946,263
Int. Cl.[2] H04N *5/33*
U.S. Cl. 358—113 **1 Claim**

1. A method for improving performance of return beam type infra red vidicon camera tubes in a television system comprising the steps of: directing the camera window toward incident optical irradiance; fully charging each element of the vidicon image sensing layer sequentially with an electron beam; exposing the sensing layer to an image containing infra red radiation for one television frame time and allowing the irradiance to selectively discharge the sensing layer; recharging the image sensing layer a first time, to a voltage that substantially saturates the image sensing layer, sequentially with a scanning electron beam; continuing to expose the sensing layer to an image containing infra red radiation for one television frame time and allowing other irradiance to selectively discharge the sensing layer; recharging the image sensing layer a second time, to a voltage that substantially saturates the image sensing layer sequentially with a scanning electron beam; continuing to



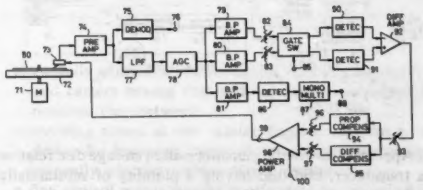
expose the sensitive layer of an image containing infra red radiation for one television time frame and allowing the irradiance to selectively discharge the sensing layer; recharging the image sensing layer a third time to a voltage fully charging said layer; measuring the current of the return charging beam and amplifying said beam by electron multiplier dynodes and directing the amplifier signal to a television display unit.

4,190,859

TRACKING CONTROL APPARATUS FOR USE IN APPARATUS FOR REPRODUCING VIDEO SIGNALS FROM A ROTARY RECORDING MEDIUM

Hisao Kinjo, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 7, 1978, Ser. No. 884,142
Claims priority, application Japan, Mar. 8, 1977, 52-25260
Int. Cl.[2] G11B *21/10*
U.S. Cl. 358—128.5 **6 Claims**



1. A tracking control system in a reproducing apparatus having a transducer for reproducing signals recorded on a rotary recording medium in which a main information signal has been recorded in a plurality of adjacent tracks, first and second reference signals having different frequencies, each of said reference signals being alternately recorded at intermediate positions between longitudinal center lines of the adjacent tracks, and a third reference signal being recorded at positions corresponding to a switching of the first and second reference signals, said first, second and third reference signals being in a frequency band which is lower than the frequency band of the main information signal, said tracking control apparatus comprising:

means for controlling the reproducing transducer to correctly track along the main information signal track;

a first separating means for filtering and separating a low frequency band component including at least the first,

second and third reference signals from the signal reproduced by the reproducing transducer;

a second separating means for separating the low frequency band component into the first, second and third reference signals;

means for detecting the separated first and second reference signals;

means for selectively switching the separated first and second reference signals responsive to the separated third reference signal, said switched first and second reference signals being supplied to the detecting means;

a control signal producing means for producing a control signal in response to the outputs of the detecting means and for applying the control signal to the tracking control means; and

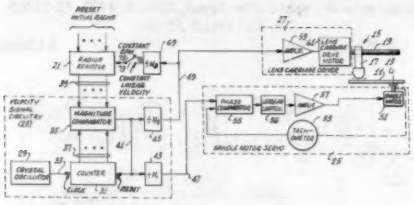
automatic gain control means for bringing the levels of the separated first, second and third reference signals to a predetermined level, said automatic gain control means being in a signal transmission path between the first separating means and the control signal producing means.

4,190,860

DIGITAL METHOD AND APPARATUS FOR ROTATING AN INFORMATION STORAGE DISC

Frank J. Somers, Santa Monica, and John S. Winslow, Altadena, both of Calif., assignors to MCA Discovision, Inc., Universal City, Calif.

Filed Nov. 16, 1978, Ser. No. 961,362
Int. Cl.² G11B *19/24, 19/14*
U.S. Cl. 358—128.5 **23 Claims**



1. Apparatus for rotating an information storage disc relative to a transducer, said disc having a plurality of substantially circular and concentrically arranged information tracks, wherein said transducer is radially movable relative to said disc to be positioned in a prescribed relationship relative to a selected one of said tracks, and the relative angular velocity of the information disc is controllably varied according to the radius of the selected information track, said apparatus comprising:

means for producing a digital measure of the radius of the particular information track selected;

oscillator means for producing a clock signal having a substantially constant frequency;

means, responsive to the radius measure and the clock signal, for producing a disc velocity signal that has an instantaneous frequency corresponding to the frequency of the clock signal divided by the radius measure; and

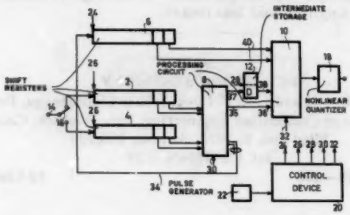
means for adjusting the angular velocity of the information disc according to the instantaneous frequency of the disc velocity signal.

4,190,861

METHOD AND ARRANGEMENT FOR REDUNDANCY-REDUCING PICTURE CODING

Peter Lux, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,894
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640140
Int. Cl.² H04N *7/12*
U.S. Cl. 358—135 **11 Claims**



1. A method of redundancy-reducing coding of the values of picture elements of pictures which are scanned line-by-line and which are distributed in a matrix as lines and picture elements, a difference value being formed for substantially each picture element, said difference value being the difference between the actual value of the picture element and a predictive value obtained from the values of other picture elements, comprising the steps of:

dividing the picture matrix into adjacent, equally large, square sub-pictures;

intermediate storing the values of the picture elements of the picture lines which are covered by a series of sub-pictures;

obtaining the predictive value for a picture element from the values of the other picture elements of the associated sub-picture; and

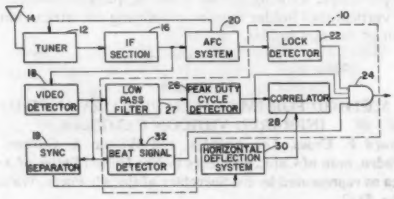
quantizing the resulting first difference values.

4,190,862

VIDEO CARRIER RECOGNITION SYSTEM

Richard W. Citta, Oak Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 6, 1978, Ser. No. 875,645
Int. Cl.² H04N *5/50*
U.S. Cl. 358—195 **9 Claims**



1. In a television receiver having a tuner responsive to a received RF television signal for developing video and audio IF subcarrier signals, an AFC system for locking one of said IF subcarrier signals to the video IF frequency of said receiver and a video detector for detecting said video IF subcarrier signals; the improved circuit for producing a recognition signal in response to said video subcarrier being locked to said video IF frequency comprising:

first detector means coupled to said AFC system for developing a first control signal in response to said AFC system being locked to an IF subcarrier signal;

filter means connected for low-pass filtering the output of said video detector;

second detector means coupled to said filter means for developing a second control signal in response to said low-pass filtered output of said video detector comprising a plurality of signal spikes whose peaks are characterized by a duty cycle having a value less than a predetermined value, said spikes having a predetermined polarity and corresponding to the horizontal synchronizing pulses of said television signal; and

coincidence gate means coupled to said first and second detectors and responsive only to the presence of said first and second control signals for producing said recognition signal.

4,190,863

REMOTE CONTROL SYSTEM FOR A TELEVISION CAMERA

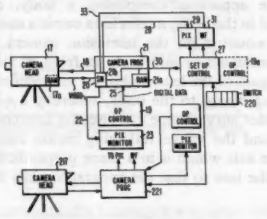
Robert A. Dischert, Burlington, and Laurence J. Thorpe, Marlton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 6, 1978, Ser. No. 894,009

Claims priority, application United Kingdom, May 23, 1977, 22805/77

Int. Cl.[2] H04N *5/24, 5/26*

U.S. Cl. 358—210 **6 Claims**



1. A system for providing remote control of a television camera having a source of television sync signals comprising:

a remote unit having a plurality of selective controls and analog to digital converter means coupled to each of said plurality of selective controls and responsive to said sync signals for separately and sequentially providing binary signals which are binary digital representations of the selected control values of said selective controls during each television field;

means including a digital to analog converter in said television camera responsive to the television horizontal sync signals for converting sequentially during each television field said binary signals to amplitude level signals corresponding to the binary signal,

means including a single transmission line for coupling the output signals from said analog to digital converter means to said digital to analog converter in said camera,

a plurality of separate temporary storage devices in said camera for temporarily storing the amplitude level signals between television fields, and

means in said camera responsive to the sequence of said amplitude level signals for sequentially coupling said amplitude level signals from said digital to analog converter to the appropriate temporary storage devices in the camera.

4,190,864

REMOTE IRIS CONTROL FOR TELEVISION CAMERAS

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,339

Int. Cl.[2] H04N *5/30*

U.S. Cl. 358—210 **3 Claims**

1. A digital control system for use with a camera having an electronically controllable light admitting means such as a motor driven iris, comprising:

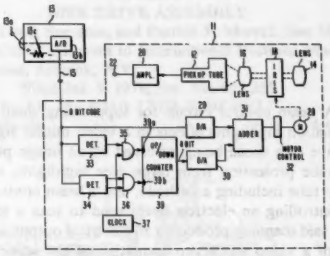
a manually adjustable control device having first and second limit positions and positions therebetween,

converting means coupled to said control device for providing binary coded signals representing the manually selected position of said device,

fine control means coupled to said converting means and said electronically controllable light admitting means and responsive to said binary coded signals representing positions between said limit positions for directly controlling in relatively small increments the opening of the iris within a relatively narrow range of the required total iris opening range, and

coarse control means coupled to said converting means and said electronically controllable light admitting means and responsive to binary coded signals representing said control device at substantially said first limit position for opening the iris at a constant rate and responsive to binary coded signals representing said control device at substantially said second limit position for closing the iris at a constant rate to thereby position the iris opening in the desired range said fine control means will operate.

3. A digital iris remote control system for remotely controlling a television camera having an electronically controllable light admitting means such as a motor driven iris comprising:



a manually adjustable control device remotely located from said camera having first and second limit positions and positions therebetween,

converting means at said remote location coupled to said device for providing binary coded signals representing a manually selected position of said device,

a fine control means located at said camera and coupled to said light admitting means and responsive to said binary coded signals representing positions between said limit positions for directly changing in relatively small increments the iris opening within a relatively narrow range of the required total iris opening range,

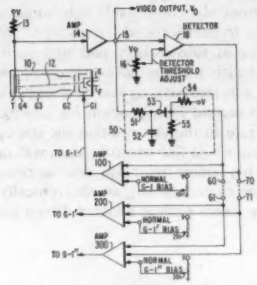
a coarse control means located at said camera and coupled to the light admitting means and responsive to said binary coded signal representing said control device at substantially a first of said limit positions for opening said iris at a constant rate and responsive to said binary coded signal representing said control device at substantially the other of said limit positions for closing said iris at a constant rate to thereby position the iris opening in the desired range said fine control means will operate, and

means including a transmission line coupled between said converting means and said coarse control means and said fine control means for coupling said binary digital control signals from said remote location to said camera location.

4,190,865
VIDEO IMAGE TUBE HIGHLIGHT SUPPRESSION CIRCUIT

Sidney L. Bendell, Riverton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 763,593, Jan. 28, 1978, abandoned. This application Aug. 10, 1978, Ser. No. 932,608
Claims priority, application United Kingdom, Dec. 13, 1976, 51834/76; Jan. 25, 1977, 02933/77
Int. Cl.[2] H04N 5/19, 9/16
U.S. Cl. 358—219 2 Claims



1. A beam control circuit for suppressing small area type illumination highlights effects in a video output signal representative of a scene being received by an image pickup tube with tube protection from large area highlights, said image pickup tube including a cathode, and a beam control element for controlling an electron beam used to scan a target electrode, said scanning producing an electrical output signal in the form of a video signal representative of the scene being received by said pickup tube by recharging said target electrode, comprising:

detector means coupled to said image pickup tube and responsive to said electrical output signal exceeding a given level indicative of highlights for providing a control signal having a leading and a trailing edge and a time duration equal to the time duration of said illumination highlights;

biasing means coupled to said image pickup tube control element for developing a steady state beam current in said image pickup tube; and

means coupled to said biasing means being responsive to said control signal for increasing said steady state beam current in the presence of said illumination highlights during said scanning so as to increase the recharge rate of said target electrode,

measuring means coupled to said image pickup tube and responsive to the video output signal therefrom for providing a second control signal representative of the average video signal level over a predetermined time period of a large area scan,

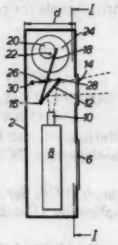
means coupled to said measuring means and responsive to said second control signal for providing a beam current disabling signal when the average video signal level exceeds a predetermined signal level indicative of a very large area overly illuminated and

means for coupling said beam current disabling signal to said beam current biasing means for disabling said beam current increase during very large area highlights.

4,190,866
SURVEILLANCE DEVICE INCORPORATING A TELEVISION CAMERA

Amiel Luknar, 28 Allerton Rd., London, N.16, England

Filed Oct. 27, 1977, Ser. No. 846,201
Claims priority, application United Kingdom, Oct. 30, 1976, 45233/76
Int. Cl.[2] G03B 37/00; H04N 5/26, 5/30, 7/18
U.S. Cl. 358—229 8 Claims

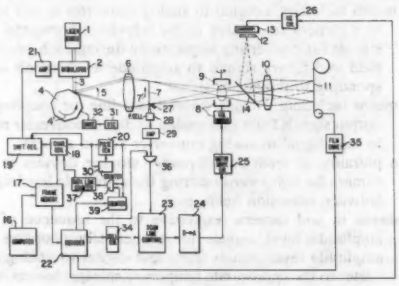


1. Surveillance apparatus for the control of access to premises, the apparatus comprising a body, an intercom unit mounted in the body, a television camera mounted in the body, a lens mounted on the television camera, image reflecting means mounted in said body in front of the lens and in the optical path of the lens, and pivot means connecting the image reflecting means to the body, whereby a visitor entering the area under surveillance can use the intercom unit to request access and the image reflecting means can then be pivoted about an axis which is in a plane perpendicular to the optical axis of the lens so that the apparatus scans the area to be surveyed.

4,190,867
LASER COM WITH LINE DEFLECTION MIRROR INERTIA COMPENSATION

Masahiro Ohnishi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 5, 1978, Ser. No. 893,634
Claims priority, application Japan, Apr. 7, 1977, 52/39005
Int. Cl.[2] H04N 1/02, 1/17
U.S. Cl. 358—285 4 Claims



1. In a method of two-dimensionally scanning a recording light beam intensity modulated in accordance with a data signal, including successively horizontally deflecting the light beam and simultaneously vertically deflecting it with a rotating mirror, a method of eliminating character image distortion immediately following a vertical scan stop or data line skipping operation due to the inertia of the rotating mirror, characterized by:

decreasing the intensity of the light beam to a level below a

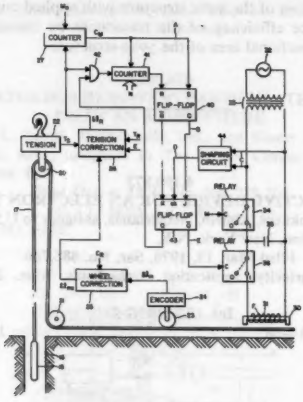
recording level immediately following a vertical scan stop or data line skipping operation for a period of time sufficient to allow the rotating mirror to reach a substantially constant rotational speed.

4,190,868

METHOD AND APPARATUS FOR AUTOMATICALLY INSCRIBING MAGNETIC MARKS ON A WIRELINE

Pierre A. Moulin, Chaville, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,603
Claims priority, application France, Oct. 26, 1976, 76 32173
Int. Cl.² G11B *5/00*
U.S. Cl. 360—1 **34 Claims**



1. Method for automatically inscribing magnetic marks on a moving steel wireline used for raising and lowering borehole tools in a borehole at varying speeds, comprising:

generating an alternating magnetic field of successively alternating positive and negative polarity for application to a zone on said moving steel wireline; and

interrupting in response to a control signal said alternating magnetic field at a time synchronized to begin between said alternations of the field substantially terminating the magnetic field applied to said steel wireline and restoring said magnetic field after a mechanically coupled measurement of movement of a predetermined length of said steel wireline past said zone to inscribe said magnetic marks on said steel wireline, said interrupting of said alternating magnetic field for said predetermined length measured independent of the speed of said moving steel wireline thereby inscribing uniform magnetic marks without generating an additional magnetic field during said interrupting.

4,190,869

SLOW MOTION TAPE DRIVING SYSTEM IN A RECORDING AND/OR REPRODUCING APPARATUS

Yoshihiko Ota, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 24, 1978, Ser. No. 908,917
Claims priority, application Japan, May 31, 1977, 52-63661; Jun. 7, 1977, 52-66925
Int. Cl.² H04N *5/795*; G11B *19/26, 15/46*
U.S. Cl. 360—10 **10 Claims**

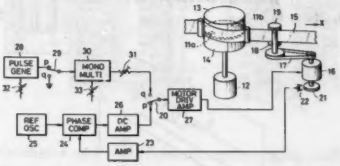
1. A tape driving system for use in a recording and/or reproducing apparatus which may be selectively operated at any of a plurality of different modes, including at least a slow-motion mode, said recording and/or reproducing apparatus having at least one rotating video signal head for tracing tracks lying obliquely on a tape and for reproducing a video signal, said tape driving system comprising:

means for driving said tape;

a DC motor for driving said tape driving means;

means for forming recurring pulse-like voltages, each of said pulses having a predetermined level and a predetermined width, said pulses recurring at a given frequency;

means for producing a continuous voltage; and



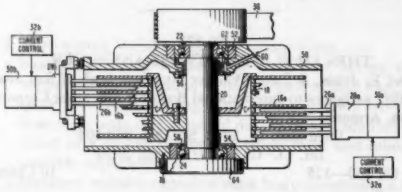
means for selectively applying either the pulse-like voltages from said forming means or the continuous voltage from said producing means to said DC motor depending on the selected reproducing mode, said pulse-like voltages being applied to said motor in a slow motion reproducing mode to rotate said motor during the pulse width and cause said tape driving means to intermittently shift said tape.

4,190,870

DISK DRIVE ASSEMBLY

Raymond Avina, San Jose, and Patrick F. Merrell, San Martin, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 5, 1978, Ser. No. 922,255
Int. Cl.² G11B *17/02*; F16C *19/52*
U.S. Cl. 360—98 **4 Claims**



1. A disk storage assembly comprising:

a multiplicity of magnetic disks;

a number of movable magnetic heads for accessing associated surfaces of said disks;

an air-tight housing enclosing said magnetic heads and disks;

a rotary spindle disposed centrally within said housing and having a longitudinal axis about which said spindle rotates;

means for mounting said disks to said spindle in an array along said axis;

means for controlling air flow into and within said housing to prevent contaminated air from circulating in said housing;

first ball bearing means located at one end of said spindle, and second ball bearing means located at the other end of said spindle; and

metal rings affixed between said housing and said spindle bearing means, wherein the coefficient of thermal expansion of said rings has a value substantially that of said spindle bearings.

4,190,871

MAGNETIC CONVERTER HAVING A MAGNETORESISTIVE ELEMENT

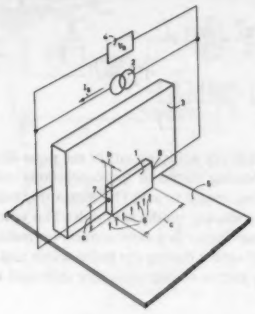
Anthonie Walraven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 682,643, May 3, 1976, abandoned. This application Feb. 23, 1978, Ser. No. 880,443

Claims priority, application Netherlands, Jun. 13, 1975, 7507049

Int. Cl.[2] G11B *5/12, 5/22, 5/30*

U.S. Cl. 360—113 **5 Claims**



1. A magnetic converter for detecting information-representing magnetic fields on a magnetic recording medium movable relative to the converter, said converter comprising a magnetoresistive strip having one end adapted to face the recording medium and means for detecting resistance variations of said strip, said detecting means including means for applying, to two opposite sides of said strip adjacent said one end, an alternating current of a sufficiently high frequency to produce a current distribution in said strip such that the current is concentrated in a region of said strip adjacent said one end and a region adjacent the end of said strip opposite said one end due to lateral skin effect.

4,190,872

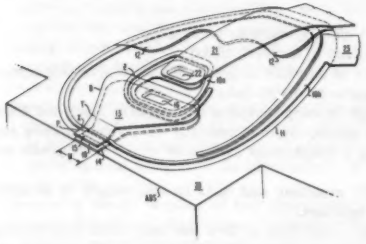
THIN FILM INDUCTIVE TRANSDUCER

Robert E. Jones, Jr., and Walther Nystrom, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1978, Ser. No. 972,104

Int. Cl.[2] G11B *5/12, 5/22, 5/20*

U.S. Cl. 360—125 **10 Claims**



1. A thin film inductive transducer for recording and reading magnetic transitions on a selectable one of a plurality of tracks on a magnetic recording medium, said transducer being of the type comprising two layers of a magnetic material forming a yoke structure that is activated by a conductor coil characterized in that:

said yoke structure adjacent its one end comprises a pole tip region in which the layers are of a predetermined substantially constant width and a preselected substantially constant thickness, said predetermined width not exceeding the width of a track on the medium, and said pole tip region extending from said one end a relatively short distance normal to the magnetic medium to an "optimum transition point", thereby to maximize resolution of transitions during recording; and

said yoke structure comprises a back region which joins said pole tip region at said "optimum transition point" and in which the layers increase progressively in width from said predetermined width, said back region having a back gap substantially centered adjacent its wider end, the thickness of the layers of magnetic material in said back region being greater than said preselected constant thickness of those layers in said pole tip region, thereby to oppose saturation of the yoke structure with applied current and enhance efficiency of the transducer by increasing the cross-sectional area of the yoke structure.

4,190,873

PROTECTIVE DEVICE FOR AN ELECTRON TUBE

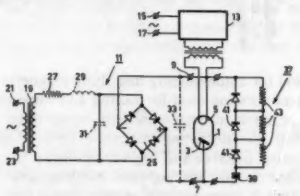
Frits H. Klokkers, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,766

Claims priority, application Netherlands, Mar. 31, 1977, 7703493

Int. Cl.[2] H05G *1/12*

U.S. Cl. 361—56 **12 Claims**



1. A device comprising a high voltage generator having output terminals, an electron tube having two electrodes connected to said output terminals of the high voltage generator, means connecting said two electrodes to a protection circuit which comprises a capacitor and a number of diodes connected in series with the forward direction of the diodes extending from the tube electrode of highest potential to the tube electrode of lowest potential, a parasitic capacitance being present between said two electrodes, and the capacitance of the capacitor being chosen substantially higher than said parasitic capacitance occurring between the two electrodes.

4,190,874

ANTI-STATIC DEVICE FOR CLOTHES DRYERS

Raymond Pasold, 5412 N. Sawyer, Chicago, Ill. 60616

Filed Jun. 21, 1978, Ser. No. 917,452

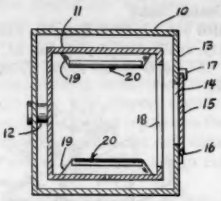
Int. Cl.[2] H05F *3/00*

U.S. Cl. 361—212 **4 Claims**

1. An anti-static device for use in rotary clothes dryers having a rotatable drying drum including tumbler vanes by which clothes are tumbled in heated air comprising:

(a) a conductive member mounted upon the tumbler vanes of

the clothes drying drum for contracting the clothes as they are tumbled thereby so as to induce electrical current in the



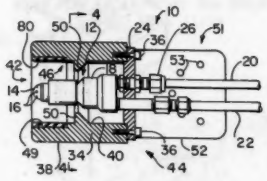
clothes thereby neutralizing static elecrical charges developed therein by friction therebetween.

4,190,875

APPARATUS FOR REMOVING PARTICULATE MATTER FROM AN ATMOSPHERE

William L. Smart, Indianapolis, Ind., and Stuart A. Hoenig, Tucson, Ariz., assignors to The Ritten Corporation, Ltd., Ardmore, Pa.

Filed Oct. 4, 1976, Ser. No. 729,204
Int. Cl.[2] B05B 5/02; B03C 3/16
U.S. Cl. 361—228 **13 Claims**



1. Apparatus for removing contaminants from an atmosphere comprising means for dispensing atomized particles of pollution control liquid, means connecting a supply of such pollution control liquid to the dispensing means, means for inductively charging the particles of liquid as the particles are atomized to generate a charged fog of pollution control liquid particles, a power supply for energizing the charging means connected to the charging means, and a collar fabricated from an insulating material and having a generally cylindrical inner wall and open forward and rearward ends, and means for supporting both the dispensing means and the charging means interiorly of the collar in fixed spaced-apart relation.

4,190,876

VARIABLE CAPACITORS

Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

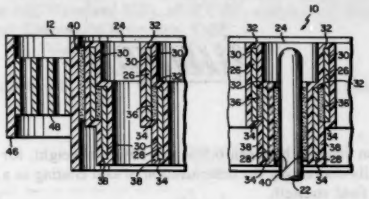
Filed Feb. 3, 1978, Ser. No. 874,908
Int. Cl.[2] H01G 5/04
U.S. Cl. 361—278 **16 Claims**

1. A capacitor having two electrodes which are separated from one another in which the improvement comprises:

both of said electrodes comprising elongated, electrically conductive strips having sides, top and bottom edges, and ends,

dielectric means securing said electrodes together along their lengths so that the top edge of one of said electrodes is adjacent to the bottom edge of the other of said electrodes so that said electrodes are oriented vertically with respect to one another, and so that at least some portions of the sides of said electrodes do not overlap one another,

said electrodes and said dielectric means being disposed in a helical coil in which the turns are spaced outwardly from the axis of the coil from one another to a sufficient extent so as to permit relative movement between at least some adjacent turns in a direction which is axial relative to the axis of said coil,



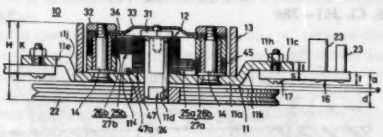
said electrodes and said dielectric means being sufficiently flexible so as to permit such relative movement between at least two adjacent turns of said coil.

4,190,877

MINIATURE VARIABLE CAPACITOR

Shigeyoshi Odagiri, Machida; Yoshikatsu Iizuka, Tama, and Tugiaki Danmura, Zama, all of Japan, assignors to Mitsumi Electric Co., Ltd., Chofu, Japan

Filed Oct. 13, 1978, Ser. No. 951,295
Claims priority, application Japan, Oct. 15, 1977, 52-138518; Oct. 15, 1977, 52-138519; Mar. 27, 1978, 53-34090; Jul. 7, 1978, 53-93722; Jul. 11, 1978, 53-95438
Int. Cl.[2] H01G 5/06
U.S. Cl. 361—298 **9 Claims**



1. A miniature variable capacitor comprising:

a base plate having a base plate main part having stator support poles embedded in one surface of said base plate main part and mounting plate parts extending from said base plate main part in lateral directions and adapted to be fitted to a mount member different from said miniature variable capacitor; and

a miniature variable capacitor main body comprising a rotor shaft rotatably supported at the center of said base plate main part, stator plate groups fixedly supported on said stator shafts, and rotor plate groups fixedly supported on said rotor shaft,

said base plate further having bent parts bent in the direction in which said stator poles project and formed between said base plate main part and said mounting plate parts and integral therewith, said mounting plate parts being not on the same level as said base plate main part but stepped in the stator support poles projecting direction from said base plate main part.

4,190,878

SELF-HEALING ELECTRICAL CAPACITOR

Herbert Förster, Remshalden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,431
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2730038
Int. Cl.[2] H01G 1/017
U.S. Cl. 361—305 **6 Claims**

1. In an electrical capacitor having a dielectric and an elec-

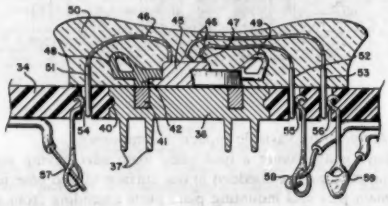
trode aluminum coating on said dielectric and an opposed electrode, the improvement comprising a substantially evenly distributed proportion of copper in said coating, said proportion ranging between 0.5% and 10% by weight, for substantially decreasing the deterioration of said coating as a function of field strength.

4,190,879

PLASTIC CHASSIS WITH MAGNETIC HOLDING MEANS FOR ELECTRONIC COMPONENTS

Pierre L. Tissot, 863 Via de la Paz, Pacific Palisades, Calif. 90272

Filed Aug. 21, 1978, Ser. No. 935,487
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—386 7 Claims



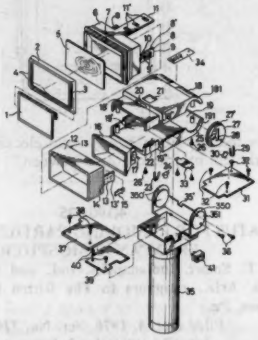
1. An electronic system including, in combination:
(a) a plastic chassis;
(b) a magnetic ring held in said plastic chassis with an exposed flat annular top surface coplanar with the top surface of said chassis;
(c) a cooperating collar member of magnetically responsive material having an exposed flat annular bottom surface congruent with said exposed flat annular top surface for magnetic securement thereby;
(d) electronic component holding means forming a part of said cooperating collar member;
(e) an electronic component secured to said means and having downwardly extending asymmetrically positioned electrical connectors passing below and outside of said flat annular bottom surface of said collar member;
(f) electrical connecting socket means embedded in said plastic chassis in corresponding asymmetrical positions outside said flat annular top surface of said magnetic ring which receive said electrical connectors,
whereby said electrical connectors are received in the corresponding socket means, said annular top surface of said magnetic ring is in full surface contact with said flat annular bottom surface of said collar member so that the connections and electronic component are securely held by said magnetic ring and cooperating collar member.

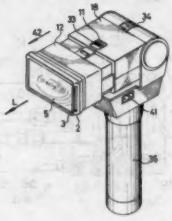
4,190,880

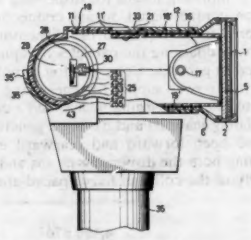
PHOTOGRAPHIC FLASH DEVICE

Koreaki Esaki, Suita, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Jul. 17, 1978, Ser. No. 925,629
Claims priority, application Japan, Jul. 27, 1977, 52/90739
Int. Cl.[2] G03B *15/02, 15/05, 7/08, 7/16*
U.S. Cl. 362—18 3 Claims







1. A photographic flash device comprising:
a first body housing a light source;
a second body rotatably connected to said first body;
a first detent mechanism for selectively positioning the first and second bodies at predetermined rotational positions with respect to one another, said detent mechanism including: a rotation guide disk which is rotatably mounted within a circular opening in said first body and secured to side wings of said second body, and first click stop means provided between said rotation guide disk and said circular opening;
a first molding slidably movable with respect to said first body, said molding supporting a fresnel lens in front of said light source; and
connection means provided with a second detent mechanism for selectively positioning the first body and the first

molding at predetermined positions relative to one another whereby the distances between the light source and the fresnel lens are varied, said connection means and second detent mechanism including: click guide levers which project from said first molding and which are provided with multiple detent notches, said click guide levers being received within slots provided in said first body, a second molding surrounding the first molding and relatively movable with respect thereto to support the first molding as it is moved relative to the first body, said second molding being provided with slidable control arms adapted to pass through said slots to extend within said first body, and

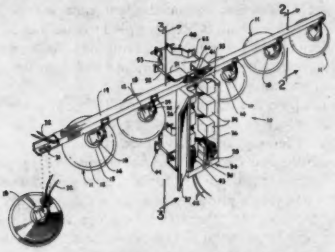
second click stop means provided on said control arms and operatively related with said multiple detent notches of said first molding.

4,190,881

CROSSARM ASSEMBLY FOR HIGH INTENSITY DISCHARGE LUMINARIES

James L. Drost, and Myron K. Gordin, both of Oskaloosa, Iowa, assignors to Muscatine Lighting Manufacturing Co., Muscatine, Iowa

Filed May 12, 1978, Ser. No. 905,276
Int. Cl.² F21V *21/14*
U.S. Cl. 362—250 **3 Claims**



1. A preassembled and prewired crossarm assembly of spaced apart high intensity discharge luminaries mountable on a light pole, said assembly comprising:

(a) a ballast-receiving box having a top side, a bottom side, and four side walls to form an enclosure having a wire receiving aperture in one of said sides,

(b) a plurality of ballasts for said luminaries contained in said ballast box,

(c) an elongated tubular bar having a medial portion fixed to at least said one side of said ballast box, said bar formed with a wire receiving aperture in alignment with the aperture in said one side of said box,

(d) means for adjustably mounting said luminaries on said tubular bar, each of said mounting means having a wire-receiving passage means in communication with the interior of said tubular bar and an associated luminary,

(e) electrically conductive wire means disposed through the passage means of said mounting means, the interior of said tubular bar and the aligned apertures of said bar and said box for electrically connecting said luminaries to said ballasts, and

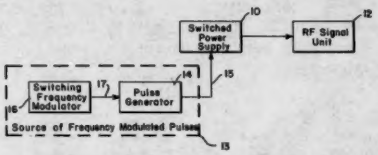
(f) means for releasably securing said ballast box to said light pole with at least one side of said ballast box adjacent said pole so that the weight of said box and the ballasts enclosed therein is centered on said pole.

4,190,882

SYSTEM FOR REDUCING THE EFFECTS OF POWER SUPPLY SWITCHING

Arthur C. Chevalier, Culver City; Arthur S. Zinkin, Rancho Palos Verdes; Robert Rosen, Granada Hills, and Richard P. McGarrity, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1977, Ser. No. 794,287
Int. Cl.² H02M *3/28*
U.S. Cl. 363—26 **6 Claims**



1. A DC power supply for providing power to a utilization device comprising:

a source of AC power,

rectifier means coupled to said source of AC power,

a switching regulator coupled to said rectifier means and being responsive to switching pulses applied to a terminal, said switching regulator responding to the pulse width of said switching pulses to provide a DC voltage,

a source of modulated pulses for providing modulated pulses to form said switching pulses, said modulated pulses and said switching pulses having a pulse repetition frequency that is continuously modulated over a selected frequency range,

control means coupled to the terminal of said switching regulator and being responsive to said modulated pulses and a feedback voltage to provide said switching pulses having pulse repetition frequencies determined by said modulated pulses and pulse widths determined by said feedback voltage,

a DC to AC converter coupled to said switching regulator for responding to said DC voltage,

transformer means coupled to said DC and AC converter, and

rectifier and filter means coupled between said transformer means and said utilization device and providing said feedback voltage.

4,190,883

SWITCHING-REGULATED DC-TO-DC CONVERTER

Philip M. Cowett, Jr., Olney, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

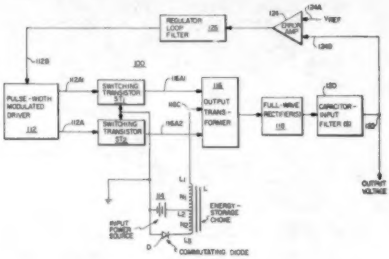
Filed Aug. 24, 1977, Ser. No. 827,281
Int. Cl.² H02M *3/335*
U.S. Cl. 363—26 **8 Claims**

1. In a switching regulated DC-to-Dc converter circuit including pulse-width modulated driver circuit means and first and second switching means driving opposite sides of an input winding of an output transformer, said input winding having a center tap and said switching means being duty cycle modulated by said driver circuit means to reverse the voltage applied to the said input winding and having a common terminal therebetween, said switching regulated DC-to-DC converter circuit further comprising:

a choke coil connected from said common terminal of said switching means to said center tap of said transformer input winding; and

a source of direct current input voltage connected in series with one portion of said choke coil from said common terminal to said center tap, said source of direct current dividing said choke coil into two portions including said

one portion and a second portion, said one portion of said choke coil having N_1 turns, said second portion having N_2 turns thereby defining a turns ratio equal to N_1/N_2 associated with said choke coil, said turns ratio of said choke coil being so selected as to permit said duty cycles



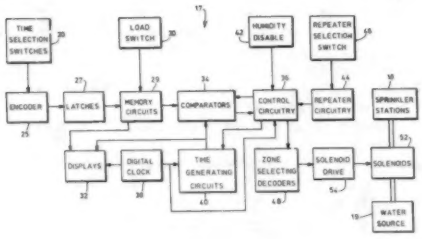
of each of said respective switching means to exceed 50% without the occurrence of a current spike at said input winding of said output transformer thereby resulting in a wide range of voltage regulation by utilization of a wide range of input power source voltages for a given output voltage.

4,190,884

AUTOMATIC DIGITAL WATER CONTROL SYSTEM

Alvaro Medina, 714 Lincoln Pl., Boulder, Colo. 80302

Filed Aug. 28, 1978, Ser. No. 937,237
Int. Cl.[2] **G05B** *1/08, 11/18;* **G06F** *3/05*
U.S. Cl. 364—104 **27 Claims**



1. A system for automatically controlling at least one timed operation of a controlled device, said system comprising:

at least one memory unit capable of storing timing information and providing an output indicative thereof, said memory unit including a plurality of interconnected memory circuits for providing timing information with respect to both minutes and hours;

programming means connected with said memory unit for causing predetermined timing information to be stored in said memory unit indicative of timing required for operation of a device controlled by said system;

signal generating means for generating time related signals;

comparator means for receiving said time related signals from said signal generating means and said output indicative of timing information from said memory unit and responsive thereto producing a timewise indicative output; and

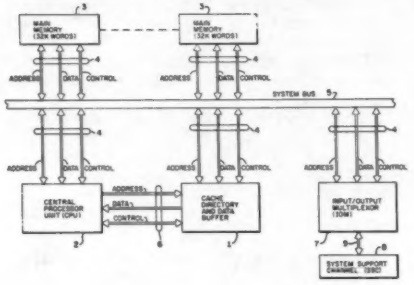
control enabling means connected with said comparator means to receive said timewise indicative output therefrom and responsive thereto producing an ouput suitable for timewise controlling the operation of a said controlled device.

4,190,885

OUT OF STORE INDICATOR FOR A CACHE STORE IN TEST MODE

Thomas F. Joyce, Burlington, and William Panepinto, Jr., Tewksbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1977, Ser. No. 863,096
Int. Cl.[2] **G06F** *11/00, 13/00*
U.S. Cl. 364—200 **9 Claims**



1. A data processing system comprising:

a system bus;

an addressable main memory coupled to said bus, said main memory including a plurality of sets of word locations, each set of word locations being defined by an address, and a number of said word locations storing a plurality of test and verification instructions and data words;

a central processor unit (CPU) coupled to said bus, said CPU including means for generating requests to said main memory for read out of said test and verification instructions on said system bus;

a cache coupled to said bus and said CPU, said cache including:

a data buffer having a plurality of word locations arranged in a plurality of sets of word locations defined by said column addresses for storing duplicates of said data words;

a directory having a plurality of word locations corresponding to the number of sets of word locations in said data buffer, said directory word locations being addressable by said column addresses, each word location of said directory storing a row address of one of a corresponding one of said words of said set stored in said data buffer, said data buffer and normally storing said duplicates of said data words on transfer from main memory when requested by cache requests;

said cache further including means responsive to said test and verification instructions, said means including:

mode control means coupled to said system bus; and,

no hit fault means coupled to said system bus and said mode control means;

said CPU including means operative in response to a first of said test and verification instructions, for generating a plurality of signals for transfer to said bus, a first signal of said plurality of signals switching said mode control means from a reset state to a first state;

said no hit fault means, including means responsive to said mode control means in said first state and conditioned by the remainder of said plurality of signals when properly coded for setting said no hit fault means to a first state;

said CPU including means for normally forcing successive cache request signals to a first state from a reset state for causing the transfer of each of said duplicates of data words from successive word locations in said data buffer cache to said CPU;

said no hit fault means in said first state being responsive to said cache request signals and to a signal indicative of the

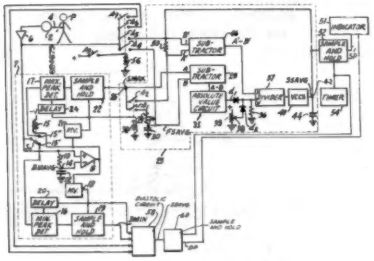
failure of said cache directory to cause a readout of a specified row address stored in a specified column address of said cache directory as specified by said CPU for generating a no memory signal, said CPU being responsive to said no memory signal for indicating a hardward failure associated with said column address of said cache directory.

4,190,886

DERIVATION OF STEADY VALUES OF BLOOD PRESSURES

Allan P. Sherman, Lexington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 10, 1978, Ser. No. 894,679
Int. Cl.[2] G06F *15/00*; A61B *5/04*
U.S. Cl. 364—415 **10 Claims**



8. Apparatus for processing an input signal representing the variation in blood pressure with time in which there are systolic and diastolic peaks and peaks due to noise as well as undulations due to respiration in such manner as to produce an output signal having a value representing one of the systolic and diastolic peak pressures in which the effects of noise and respiration undulations are reduced, comprising

an input to which a signal representing the variation in blood pressure with time may be applied,

first means coupled to said input for deriving a first signal approximately representing the peaks of said one of the systolic and diastolic pressures of a blood pressure signal when present in such manner that the effects of the undulations and noise may be present,

second means coupled to the output of said first means for deriving a second signal representing an average of some previous peaks represented by said first signal,

third means responsive to said first and second signals for deriving a control signal representative of the absolute value of the deviation between the first and second signals,

an output from which an output signal may be derived,

fourth means responsive to said first signal and a signal at said output for providing a fourth signal representative of the difference in value between the value represented by the first signal and the value represented by the signal at said output, and

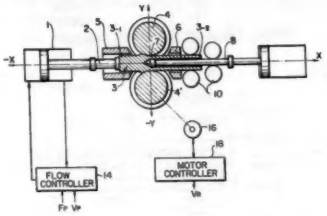
means for changing the signal at said output by a portion of the value represented by said fourth signal, the said portion increasing as said control signal gets smaller and decreasing as said control signal gets larger.

4,190,887

PRESS ROLL PIERCING METHOD

Seishiro Yoshiwara; Minoru Kawaharada, and Samon Yanagimoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 714,960, Aug. 16, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,169
Claims priority, application Japan, Aug. 22, 1975, 50-102348
Int. Cl.[2] G06F *15/46*; B21B *37/00*
U.S. Cl. 364—472 **11 Claims**



1. In a press roll piercing method for manufacturing a hollow shell wherein a polygonal metal billet is pushed in the axial direction thereof between a pair of rolling rolls mounted one above the other and having opposed semicircular grooves therein so as to be rolled into a circular or almost circular shape, and the piercing is effected in the core portion of the billet by means of a piercing plug supported between the rolling rolls, the improvement comprising;

setting the pushing force to a predetermined value sufficient to cause a compressive stress above the yielding stress of the polygonal metal billet which is being pushed when the reacting force acts upon the billet;

setting the peripheral speed of the rolling rolls and the pushing speed of the pusher in relation to each other so that the volume per unit time of the hollow shell being discharged from the rolling rolls after the press roll piercing has reached a stable condition after the biting and the volume per unit time of the polygonal metal billet being pushed into the rolling rolls become substantially equal; and

causing the billet pushed by the pusher at the pushing speed to be gripped between the rolling rolls rotating at the peripheral speed.

4,190,888

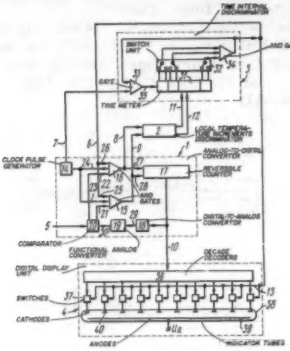
DIGITAL DEVICE FOR DETERMINING CARBON CONTENT IN IRON-CARBON MELTS

Vladimir I. Skurikhin; Leonid S. Fainzilberg, and Leonid S. Zhitetsky, all of Kiev, U.S.S.R., assignors to Institut Kibernetiki Akademii Nauk Ukrainskoi S S R, Kiev, U.S.S.R.

Filed Jun. 8, 1978, Ser. No. 913,908
Claims priority, application U.S.S.R., Jun. 13, 1977, 2496596
Int. Cl.[2] G06F *15/46*; G01N *25/02*
U.S. Cl. 364—497 **1 Claim**

1. A digital device for determining the carbon content in iron-carbon melts, comprising: a follow-up analog-to-digital converter, having an input with an applied signal carrying information on the actual temperature of the melt, a conversion suppression input, an synchronized clock pulse output, first and second synchronized code pulse outputs, a parallel code output, said follow-up analog-to-digital converter converting only up to a moment of temperature hold caused by crystallization of the melt; a local temperature increments discriminator, having a first input and a second input connected to said respective first and second synchronized code pulse outputs of said follow-up analog-to-digital converter, a first output and a second output of said local temperature increments discriminator; a time interval discriminator, having reset inputs connected to said first and second outputs of said local temperature increments discriminator, a count input connected to said

synchronized clock pulse output of said follow-up analog-to-digital converter, an output connected to said conversion suppresion input of said follow-up analog-to-digital converter;



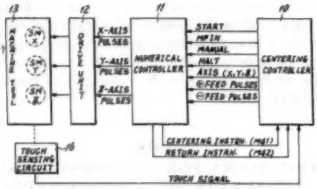
a digital display unit, having an information input connected to said parallel code output of said follow-up analog-to-digital converter, a control input connected to said output of said time interval discriminator.

4,190,889

AUTOMATIC CENTERING CONTROLLER FOR A MACHINE TOOL

Kunihiko Etoh, Toyota; Kaoru Owa, Nukata, and Kunimichi Nakashima, Anjoh, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Aug. 25, 1978, Ser. No. 936,780
Claims priority, application Japan, Aug. 26, 1977, 52-103033
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—474 **13 Claims**



1. In a combination of a machine tool having a tool spindle rotatably carried therein, and a plurality of servomotors for effecting movement of said tool spindle relative to an article mounted on said machine tool along orthogonal first and second axes, the improvement comprising:

drive control means connected to said servomotors for selectively controlling operations of said servomotors in accordance with feed pulses and axis designation signals applied thereto; and

an automatic centering controller comprising,

touch sensing means capable of being received in said tool spindle, with a probe thereof being in concentric relation with the axis of said tool spindle and capable of outputting a touch signal each time said probe in said tool spindle is brought into contact with a reference circumferential surface provided on said article,

a pulse generator connected to said drive control means for applying thereto said feed pulses so as to drive said servomotors,

first pulse control means connected to said pulse generator and said drive control means and responsive to said touch signal for applying said axis designation signals to said drive control means and controlling said feed pulses applied to said drive control means so as to effect the relative movement of said tool spindle along each of said first and second axes from one to the other of two points at both of which said probe in said tool spindle touches said reference circumferential surface,

second pulse control means connected to said pulse generator and said drive control means for applying said axis designation signals to said drive control means and controlling said feed pulses applied to said drive control means so as to effect said relative movement of said tool spindle from said other toward said one of said two points along each of said first and second axes, and

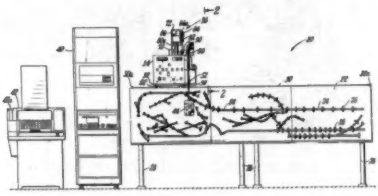
pulse counting means connected to said first and second pulse control means for counting said feed pulses applied from said first and second pulse control means to said drive control means so as to cause said second pulse control means to stop applying said feed pulses to said drive control means when receiving from said second pulse control means said feed pulses of a number of corresponding to half of said feed pulses applied from said first pulse control means.

4,190,890

PROGRAMMABLE LIGHT DIRECTOR SYSTEM

Warren G. Marx, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, NY

Filed Nov. 16, 1977, Ser. No. 852,076
Int. Cl.[2] H05K *13/00*; G06F *15/20*
U.S. Cl. 364—491 **21 Claims**



1. A programmable light director system for randomly routing wires on a harness board comprising:

(i) light source means for generating a light beam;

(ii) two-axis control means operative with said light source means for controlling the projection of said light beam on said harness board;

(iii) central processor means operatively coupled to said two-axis control means to generate command signals thereto from predetermined wire path data base to cause said two-axis control means to move the light beam continuously along a wire path in response thereto, said central processor means including scanning wand input means for automatically identifying each of said wires to be routed, said central processor means further including digitizing means for assigning coordinates to the points comprising said wire path.

4,190,891

SYSTEM HAVING A FIXED EXCITATION AND PROVIDING A VARIABLE RATIO OUTPUT

Henry R. Kosakowski, Denville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed May 9, 1978, Ser. No. 904,355
Int. Cl.[2] G06J *1/00*; G06G *7/16*
U.S. Cl. 364—606 **12 Claims**

1. A system having a fixed excitation and providing a variable ratio output, comprising:

a signal source for providing a fixed reference signal;

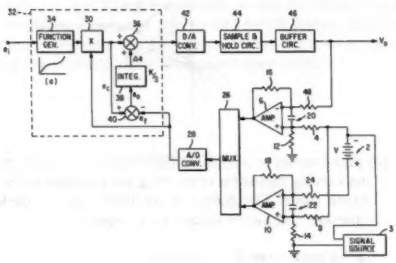
first means connected to the signal source for measuring the

amplitude of the reference signal relative to system ground;

means for providing a variable ratio command signal;

first combining means for combining the measured signal from the first means and the variable ratio command signal to provide a signal at a commanded variable ratio amplitude relative to the amplitude of the reference signal;

second means connected to the signal source and the first combining means and responsive to the signals therefrom for providing a feedback signal;



means for multiplexing the measured signal and the feedback signal and providing a multiplexed signal;

second combining means for combining the multiplexed signal and the signal at the commanded variable ratio amplitude relative to system ground; and

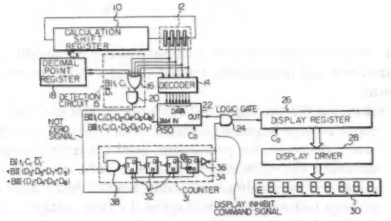
means connected to the second combining means and responsive to the combined signal therefrom for providing an output signal at a variable ratio amplitude relative to the amplitude of the reference signal.

4,190,892

ZERO SUPPRESSING SYSTEM FOR ELECTRONIC DEVICE

Heihachiro Ebihara; Fukuo Sekiya, both of Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,553
Claims priority, application Japan, Jun. 7, 1977, 52-66967
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—711 **7 Claims**



1. An electronic device having display means for display of data in digital form, comprising:

storage circuit means for storing said data;

detection circuit means coupled to an output terminal of said storage circuit means for detecting a non-significant zero value digit in said data and producing an output signal indicative of said zero value digit;

counter circuit means responsive to said output signal from said detection circuit means for counting the number of non-significant zero value digits in said data and producing a display inhibit command signal indicative of said zero value digit; and

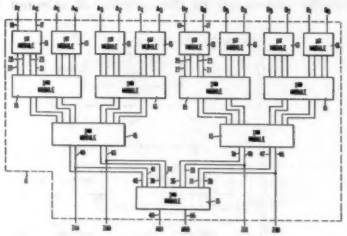
gate circuit means operative to transfer said data to said display means which consequently display said data and responsive to said display inhibit command signal for inhibiting transfer of parts of said data corresponding to said zero value digit to said display means for thereby causing said display means to suppress display of said non-significant zero value digits.

4,190,893

MODULAR MODULO 3 MODULE

Daniel D. Gajski, Campaign, Ill., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 17, 1977, Ser. No. 852,445
Int. Cl.[2] G06F *7/48, 7/50*
U.S. Cl. 364—746 **1 Claim**



1. A modular modulo 3 module having a plurality of input terminals for receiving in parallel binary coded numerical data and a plurality of output terminals for outputting the modulo 3 residue of received data, said modulo 3 module comprising:

a plurality of modular first means, each first means therein having a first and a second input line for receiving data binary coded data designable X_0 and X_1 and a first, second, third and fourth line for individually outputting Y_0, $\overline{Y}_0$, Y_1 and $\overline{Y}_1$ wherein $Y_1=X_1\overline{X}_0$ and $Y_0=\overline{X}_1X_0$;

a logrithmic array of modular second means, each second means therein having eight input lines for receiving binary coded data designable X_0, $\overline{X}_0$, X_1, $\overline{X}_1$, X_2, $\overline{X}_2$, X_3 and $\overline{X}_3$ and four output lines for individually outputting Y_0, $\overline{Y}_0$, Y_1 and $\overline{Y}_1$ wherein

$$Y_1=X_2X_0+\overline{X}_3\overline{X}_2X_1+\overline{X}_3X_1\overline{X}_0$$

and

$$Y_0=\overline{X}_3\overline{X}_2X_0+\overline{X}_2\overline{X}_1X_0+X_3X_1$$

and

connecting means for connecting said plurality of input terminals of said modular modulo 3 with the inputs of said plurality of modular first means, the outputs of said plurality of modular first means with the inputs of said logrithmic array of modular second means, and the outputs of said logrithmic array of modular second means with said plurality of output terminals of said modulo 3 module.

4,190,894

HIGH SPEED PARALLEL MULTIPLICATION APPARATUS WITH SINGLE-STEP SUMMAND REDUCTION

J. Craig Mudge, Weston, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 10, 1978, Ser. No. 885,229
Int. Cl.[2] G06F *7/52*
U.S. Cl. 364—758 **9 Claims**

1. In a data processing system, apparatus for producing the multiplication product of a multiplier and a multiplicand wherein both the multiplier and the multiplicand represent the

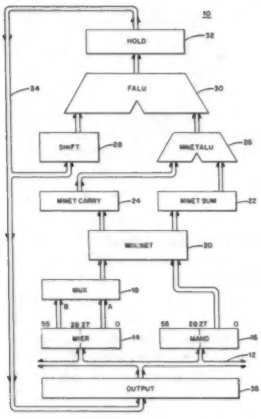
fractional portion of a floating point number, said apparatus comprising:

A. first storage means for storing the multiplier;

B. second storage means for storing the multiplicand;

C. a plurality of multiplier means each having at least one input coupled to the first storage means and at least one input coupled to the second storage means and each having a plurality of outputs, each multiplier means producing a summand at the outputs thereof comprised of a plurality of binary bits wherein each binary bit represents a power of the number 2 and each is comprised of an electrical signal having a first value representing binary 1 and a second value representing binary ϕ and wherein the cumulative total of the summands produced by the plurality of multipler means is equal to the product of the multiplier and the multiplicand;

D. a plurality of counter means each having a first output and a second output and each having a plurality of inputs individually connected to the outputs of selected multiplier



means, and each counter means arranged to count the number of binary bits in each of the summands generated by the multiplier means, representing the same power of the number 2 and having an electrical signal thereon with said first value, for producing at the first output thereof a number which may be combined with the numbers produced at the first outputs of the other counter means to form a sum number and, for producing at the second output thereof a number which may be combined with the numbers produced at the second outputs of the other counter means to form a carry number wherein the summation of the sum number and the carry number equals the multiplication product of the multiplier and the multiplicand; and

E. summing means having a plurality of inputs coupled to the first outputs of the counter means and a plurality of inputs coupled to the second outputs of the counter means for adding the carry number and the sum number and producing at the output thereof the multiplication product of the multiplier and the multiplicand.

4,190,895

METHOD AND APPARATUS FOR ROTATING CARTESIAN COORDINATE SIGNALS

Thomas J. Davis, Richland, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 27, 1978, Ser. No. 890,478

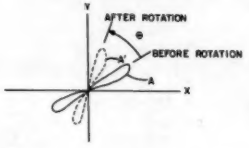
Int. Cl.[2] G06G 7/22

U.S. Cl. 364—815 **11 Claims**

1. Apparatus for rotating cartesian coordinate signals x, y about an angle θ where $x=f(t)$, $y=f'(t)$, and θ is a pre-determined angle, comprising:

(a) means for converting the cartesian coordinate signals x, y into a wave form $F(\sigma,\phi,t)=\sigma \sin(2\pi ft-\phi)$ where σ and ϕ are polar coordinate values defined by $\sigma=\sqrt{x^2+y^2}$ and $\phi=\arctan y/x$ and where $F(\sigma,\phi,t)$ is a polar coordinate signal;

(b) means connected to the converting means for varying the phase of the polar coordinate signal $F(\sigma,\phi,t)$ by a pre-determined angle θ; and



(c) phase sensitive amplitude detecting means connected to the varying means for converting the resulting polar coordinate signal $F(\sigma,\phi,\theta t)=\sigma \sin(2\pi ft-\phi-\theta)$ back into cartesian coordinate signals x', y' where

$$x'=x\cos\theta-y\sin\theta$$

$$y'=y\cos\theta+x\sin\theta$$

4,190,896

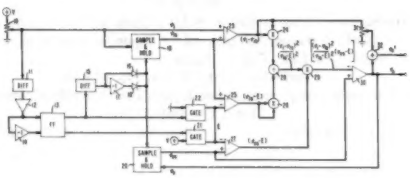
CIRCUITS HAVING SUBSTANTIALLY PARABOLIC OUTPUT VERSUS LINEAR INPUT CHARACTERISTICS

Kenneth C. Knowlton, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 5, 1978, Ser. No. 939,266

Int. Cl.[2] G06G 7/26

U.S. Cl. 364—859 **6 Claims**



1. A circuit responsive to an input voltage for producing an output voltage nonlinearly related thereto, said circuit comprising

first means (**11** through **22**, **25**, **27**) responsive each time said input voltage begins to increase, after the previous change was a decrease, for producing, until the next change is a decrease, the differences between a voltage substantially equal to the maximum possible amplitude of said input voltage and said input voltage and a first voltage, respectively, at the time said input voltage begins to increase, and, furthermore, responsive each time said input voltage begins to decrease, after the previous change was an increase, for producing, until the next change is an increase, the differences between a voltage substantially equal to the minimum possible amplitude of said input voltage and said input and first voltages, respectively, at the time said input voltage begins to decrease.

second means (**23**) responsive to said input voltage and to the amplitude of said input voltage at the time said input voltage begins to change amplitude in a direction opposite to that in which it last changed direction for producing the difference therebetween,

third means (**24**, **26**, **28**) responsive to said second means

difference output and said first means difference output involving said input voltage for producing an output equal to the square of said second means output divided by the square of said first means output involving said input voltage,

fourth means (**29**) responsive to said first means difference output involving said first voltage and said third means output for producing an output equal to the product thereof, and

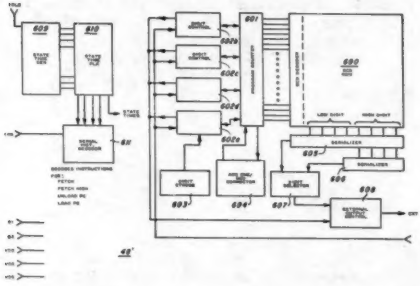
fifth means (**30**) responsive to the amplitude of said first voltage at the time said input voltage begins to change amplitude in a direction opposite to that in which it last changed direction and also to said fourth means product output for producing the difference therebetween as both said first voltage and said circuit output voltage.

4,190,897

BINARY CODED DECIMAL ADDRESSED READ-ONLY-MEMORY

Ashok H. Someshwar, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 1, 1977, Ser. No. 783,516
Int. Cl.[2] **G11C** *8/00, 17/00*
U.S. Cl. 364—900 **4 Claims**



1. A binary coded decimal read-only-memory system comprising:

(a) an array having rows and columns of memory cells,

(b) row lines and column lines associated with said array,

(c) an address register,

(d) a one bit adder and binary coded decimal corrector for incrementing the address in said address register in response to a control signal and for automatically maintaining said address in binary coded decimal format, and

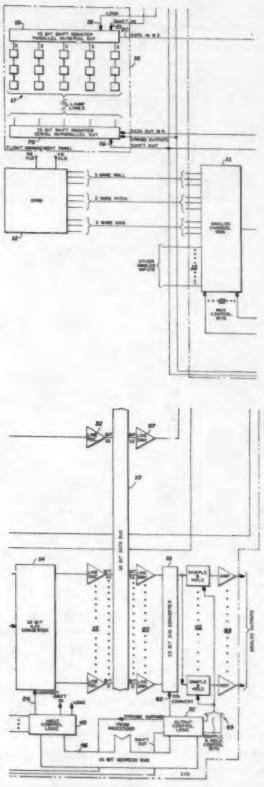
(e) means for addressing said array via said row and column lines with the address in said address register, said addressing means being responsive to the binary coded decimal address in said address register for addressing selected row and column lines in said array and being non-responsive to non-binary coded decimal addresses for addressing any selected row and column lines thereby, said addressing means comprising a plurality of decoders, said decoders being cascaded in a plurality of levels, the decoders in any given level being responsive to a preselected portion of the binary coded decimal address in said address register.

4,190,898

DIGITAL PROCESSOR INPUT/OUTPUT APPARATUS FOR ANALOG, DIGITAL AND DISCRETE DATA

David L. Farnsworth, Ft. Collins, Colo., and Ronald E. Thomas, Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 890,545
Int. Cl.[2] **G06F** *3/05, 5/04;* **H03K** *3/02*
U.S. Cl. 364—900 **10 Claims**



1. Input/output apparatus for a digital processor having a parallel bit data input/output bus for entering digital and analog data signals into said processor and for receiving digital and analog data signals from said processor comprising:

multiplexer means responsive to said analog data signals for sequentially providing said analog signals on an output thereof,

analog-to-digital converter means coupled between said multiplexer means and said data bus for converting said sequentially provided analog signals to parallel bit digital signals and for providing said parallel bit digital signals to first predetermined bits of said data bus,

parallel-to-serial shift register means coupled to receive at least one of said digital data signals in bit parallel fashion for providing said digital data signal in bit serial fashion to a second predetermined bit of said data bus simultaneously with said signals applied to said first predetermined bits,

thereby simultaneously entering said digital and analog data signals into said digital processor,

digital-to-analog converter means coupled to said first predetermined bits of said data bus for sequentially providing

analog data signals corresponding to parallel digital data signals sequentially provided to said first predetermined bits by said digital processor,

a plurality of sample and hold means coupled to said digital-to-analog converter means for sequentially sampling and holding said sequentially provided analog data signals, respectively, thereby providing said analog data signals from said digital processor, and

serial-to-parallel shift register means coupled to said second predetermined bit of said data bus for receiving at least one of said digital data signals provided in bit serial fashion, by said processor, to said second predetermined bit of said data bus simultaneously with said parallel digital data signals provided to said first predetermined bits, for providing said digital data signals in bit parallel fashion,

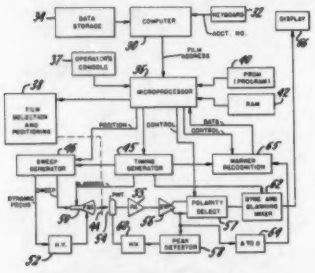
thereby simultaneously receiving said digital and analog data signals from said digital processor.

4,190,899

CARD RETRIEVAL DEVICE

Dwight H. Smith, and David L. Smith, both of Atlanta, Ga., assignors to Computer Microfilm International Corporation, Atlanta, Ga.

Filed Apr. 10, 1978, Ser. No. 894,764
Int. Cl.[2] G11B *13/00*
U.S. Cl. 364—900 **2 Claims**



1. In a storage and retrieval apparatus wherein a plurality of card type items are arranged on a storage rack which is movable for positioning an item with respect to an item retrieval arm, wherein each of said items has an edge arranged to be engaged by said retrieval arm after said rack is positioned, each of said edges having a projecting end, and wherein said apparatus includes control means to cause said arm to retrieve a selected one of said items from said rack, the improvement wherein there is provided a switch arranged to be activated by said projecting end as said selected item is withdrawn by said retrieval arm, and wherein said control means responds to activation or non-activation of said switch to either continue operation or to reattempt card retrieval, said control means includes a microprocessor having a program for controlling operation of said storage and retrieval device, and wherein said program includes two sets of instructions, one or the other of which controls operation of said device dependent upon the condition of said switch at a selected time during said device operation.

4,190,900

MAJOR/MINOR LOOP BUBBLE MEMORY WITH TIMING LOOP

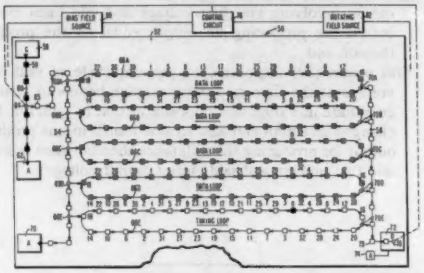
David C. Van Voorhis, Campbell, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,157
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 **6 Claims**

1. A bubble domain memory system having a major/minor loop array suitable for the storage and guided movement of bubble domains, the system comprising;

a plurality of minor loops in said array adapted for the storage of data encoded as the presence or absence of bubble domains,

a major loop positioned adjacent to the minor loops, said major loop including sensing means for detecting the presence or absence of bubbles, and



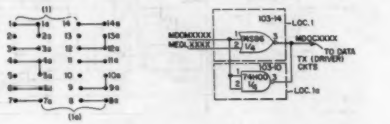
a minor loop having a single bubble therein adapted for timing purposes and positioned adjacent to said major loop and closer to said sensing means than said data storage minor loops, and said timing minor loop adapted for retaining the rotational position of bubble domains in said data storage minor loops to provide gap-free serial access to the stored data.

4,190,901

PRINTED CIRCUIT BOARD APPARATUS WHICH FACILITATES FABRICATION OF UNITS COMPRISING A DATA PROCESSING SYSTEM

Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 1, 1977, Ser. No. 856,433
Int. Cl.[2] G11C *5/02, 5/06*
U.S. Cl. 365—72 **17 Claims**



1. Apparatus for constructing a number of different memory subsystems including a number of different features which define the type of memory subsystem, said apparatus comprising:

a plurality of integrated circuit packages;

a two layer printed circuit board comprising a number of sections, each section having a number of groups of first sets of holes defining a number of positions included thereon for mounting a corresponding number of said plurality of integrated circuit packages, each package having a number of pins;

first and second layers of said two layer board each having a number of horizontal and vertical conductors respectively for applying electrical signals to said pins of each of said integrated circuit packages mounted on said board;

at least one of said number of sections including second sets of holes parallel to and offset from a plurality of said number of groups of said first sets of holes, each group of said second set of holes arranged to have the same position for electrically connecting the pins of certain ones of said plurality of integrated circuit packages mounted on said board to predetermined ones of said horizontal and vertical conductors required for the inclusion of one of a pair of said features for construction of one of said different memory subsystems.

DESIGNS

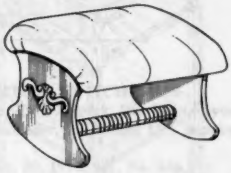
FEBRUARY 26, 1980

254,276
SWEATER
Helga I. Behrmann, 1545 W. Chase Ave., Chicago, Ill. 60626
Filed Oct. 19, 1977, Ser. No. 843,739
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—44

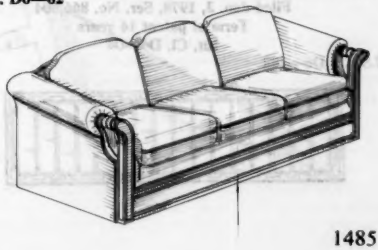
254,277
COMBINED CLEANING AND POLISHING BRUSH
Richard L. DePamphilis, 38 Sterling Rd., Hyannis, Mass. 02601
Filed Aug. 21, 1978, Ser. No. 935,323
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—06

254,278
CHAIR
Robert L. Wilson, Senatobia, Mich., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Aug. 22, 1977, Ser. No. 826,786
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

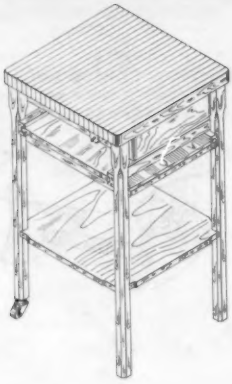
254,279
OTTOMAN
P. Lewis Phillips, Hickory, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Dec. 5, 1977, Ser. No. 857,722
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



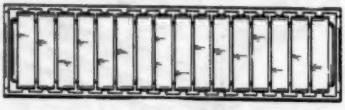
254,280
SEAT
Lester Beall, Jr., High Point, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Nov. 18, 1977, Ser. No. 852,890
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



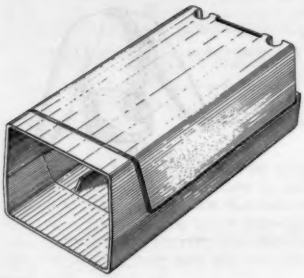
254,281
COMBINED CUTTING BOARD AND PORTABLE FOOD PREPARATION TABLE
Joe M. Kayfes, 6431 Stockton Ave., El Cerrito, Calif. 94530
Filed Jan. 30, 1978, Ser. No. 873,162
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



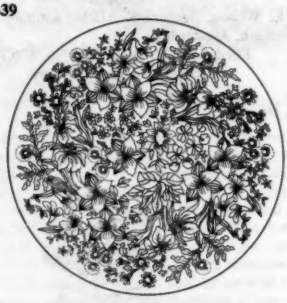
254,282
STORAGE RECEPTACLE FOR TAPE CARTRIDGES AND CASSETTES
Vaughn Aprahamian, Rego Park, N.Y., assignor to Le-Bo Products Company, Inc., Maspeth, N.Y.
Filed Jan. 3, 1978, Ser. No. 866,604
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



254,283
CABINET FOR A CARD FILE DRAWER
Gary A. Dolphin, Sr.; James F. Hampshire, and Greg P. Terek, all of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Dec. 1, 1977, Ser. No. 856,322
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

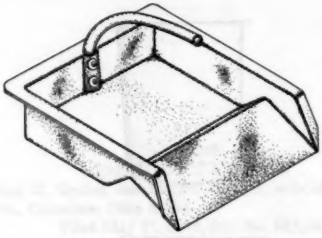


254,284
DECAL FOR CULINARY WARE OR THE LIKE
Cynthia S. Gerow, Ballston Spa, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Mar. 21, 1977, Ser. No. 779,945
Term of patent 14 years
Int. Cl. D19—*08;* D7—*01*
U.S. Cl. D7—39

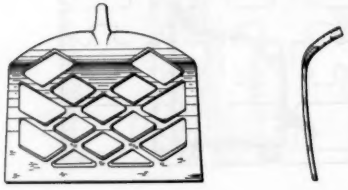


254,285
COFFEEMAKER
Ernest Lee, Park Ridge, and Robert O. Ernest, Oak Park, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 16, 1978, Ser. No. 869,552
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—41

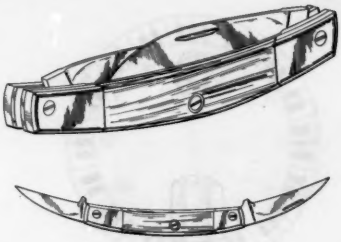
254,286
DEBRIS RECEPTACLE
Hugh O. Daniel, 3136 Birdsall Ave., Oakland, Calif. 94619
Filed May 2, 1977, Ser. No. 793,079
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—186



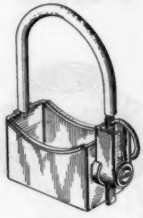
254,287
BLADE FOR A MORTAR HOE
John Polc, 18 Hemlock St., Bairdford, Pa. 15006
Filed Dec. 26, 1978, Ser. No. 972,836
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—11



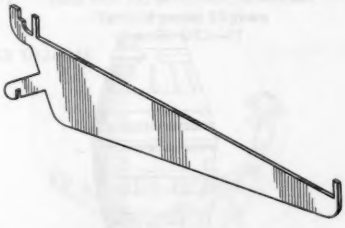
254,288
POCKET KNIFE
Cecil O. Pharr, Jr., 2272 La Vista Woods Dr., Tucker, Ga. 30084
Filed Jul. 11, 1977, Ser. No. 814,332
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



254,289
IGNITION SWITCH LOCK
Martin N. Farbstein, 20 Pickwick Dr. West, Syosset, N.Y. 11791, and Leon Schaffer, 25 Rolling Dr., Brookville, N.Y. 11545
Filed Dec. 30, 1977, Ser. No. 866,178
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—333



254,290
SHELF BRACKET
Richard C. Smith, Bloomington, Minn., assignor to R. C. Smith Company, Bloomington, Minn.
Filed Feb. 1, 1978, Ser. No. 874,272
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—381



254,291

CAP NUT

Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan

Division of Ser. No. 682,899, May 4, 1976, Pat. No. D. 247,698. This application Aug. 31, 1977, Ser. No. 829,280

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—397

254,292

LOCKING WHEEL NUT

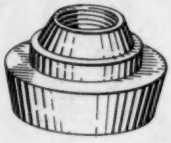
Thomas F. Kruger, 15 Redlein Dr., Lancaster, N.Y. 14086, assignor to Kintex, Inc., Buffalo, N.Y.

Filed Nov. 7, 1978, Ser. No. 958,538

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—397



254,293

PLASTIC CONTAINER FOR LIQUIDS OR THE LIKE

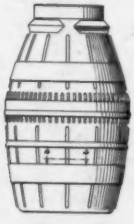
Vincent E. Fortana, and Matt Lerner, both of Coleman, Mich., assignors to Vercon Inc., Coleman, Mich.

Filed Apr. 18, 1977, Ser. No. 788,289

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—125



254,294

CONTAINER FOR FOOD PRODUCTS OR THE LIKE

William G. Reynolds, and Horst F. W. Arfert, both of Richmond, Va., assignors to Reynolds Metals Company

Continuation of Ser. No. 720,494, Sep. 3, 1976. This application Nov. 3, 1978, Ser. No. 957,794

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—216

254,295

CONTAINER FOR FOOD PRODUCTS OR THE LIKE

William G. Reynolds, and Horst F. W. Arfert, both of Richmond, Va., assignors to Reynolds Metals Company

Division of Ser. No. 720,494, Sep. 3, 1976. This application Nov. 3, 1978, Ser. No. 957,796

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—220

254,296

NIPPLE AND BOTTLE CAP RETAINER

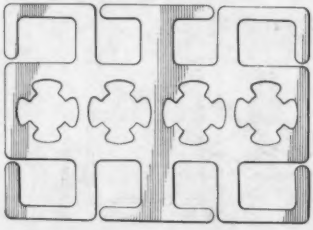
Robert G. Doneaux, 1137 E. Orange, Tempe, Ariz. 85281

Filed Apr. 13, 1977, Ser. No. 787,044

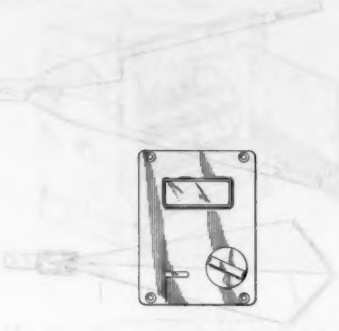
Term of patent 14 years

Int. Cl. D9—*03*

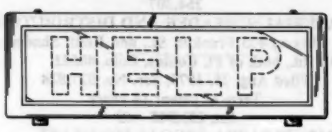
U.S. Cl. D9—294

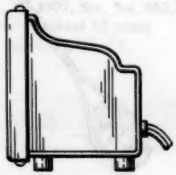


254,297
TACHOMETER
Richard W. Staiert, Geneseo, and Eugene J. Krukow, Cordova, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Mar. 2, 1978, Ser. No. 882,837
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98



254,298
EMERGENCY FLASHER
William H. Sexton, and Judy C. Sexton, both of 2675 Elliott Ave., Columbus, Ohio 43204
Filed May 17, 1978, Ser. No. 907,243
Term of patent 14 years
Int. Cl. D10—*06;* D26—*06*
U.S. Cl. D10—114

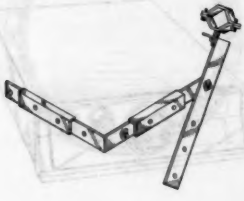




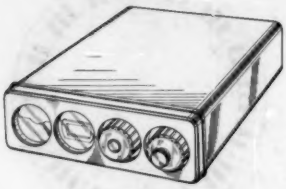
254,299
FACE FOR A CLOCK OR SIMILAR ARTICLE
Roger E. Hutchinson, 111 N. 75th, Seattle, Wash. 98103
Filed Sep. 12, 1977, Ser. No. 832,433
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

254,300
RING
Gary E. Minassian, 465 S. Ranchview Cr., Apt. 50, Anaheim, Calif. 92807
Filed Oct. 18, 1977, Ser. No. 843,354
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—28

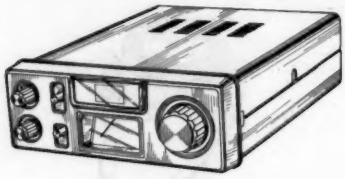
254,301
REVERSIBLE MOTORCYCLE BRACKET FOR PICKUP TRUCK BED
Thomas J. Combo, 1136 Mellor Dr., Lakeport, Calif. 95453
Filed Oct. 31, 1977, Ser. No. 847,115
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—115



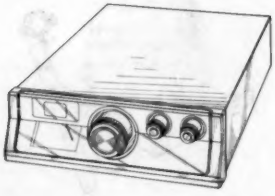
254,302
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Kikuo Ohta, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Oaza-Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,293
Claims priority, application Japan, Jan. 20, 1977, 52-1479
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



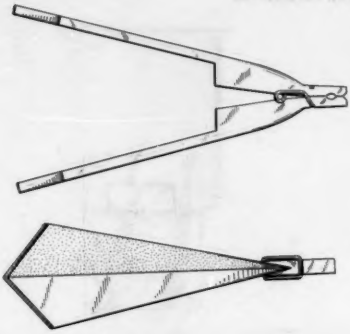
254,303
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Toshio Igo; Kikuo Ohta, both of Katano; Tsutomu Murakami, Tokyo, and Shuhei Taguchi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,294
Claims priority, application Japan, Jan. 20, 1977, 52-1474
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



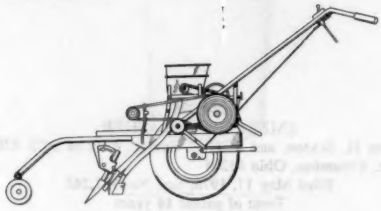
254,304
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Toshio Igo, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 20, 1977, Ser. No. 817,295
Claims priority, application Japan, Jan. 20, 1977, 52-1478
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



254,305
ANTENNA SUPPORT FOR MODEL AIRPLANE RADIO TRANSMITTORS
William J. Colish, 121 Bates Rd., Harrison, N.Y. 10528
Filed Aug. 10, 1977, Ser. No. 823,548
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—91

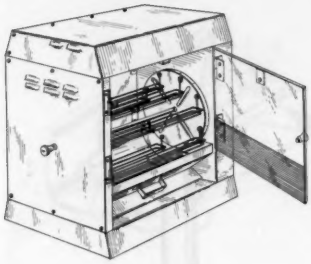


254,306
GARDEN PLOW WITH SEED AND FERTILIZER DISTRIBUTOR
William H. Carter, Rte. 1, Brundidge, Ala. 36010
Filed Dec. 19, 1977, Ser. No. 862,226
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12

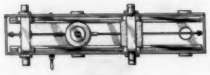


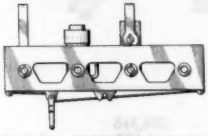
254,307
MATERIAL SPREADER AND DISTRIBUTOR
James E. Thayer, 423 Franklin St., and Keith Shader, 610 N. Taft Hill Rd., both of Ft. Collins, Colo. 80521
Filed Aug. 25, 1977, Ser. No. 827,828
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—13

254,308
FOOD WARMER
Joseph S. Polak, Cicero, and Joseph J. Sidlo, Barrington, both of Ill., assignors to Prince Castle, Inc., Addison, Ill.
Filed Dec. 27, 1977, Ser. No. 865,008
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—108

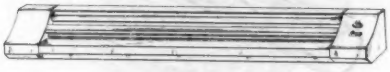


254,309
AXLE BENDING DEVICE
William N. Easom, Jr., 3234 San Marcus, Dallas, Tex. 75228
Filed Jun. 30, 1977, Ser. No. 811,490
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123

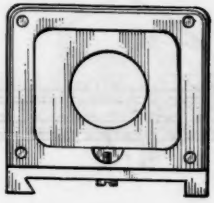




254,310
DIAZO DEVELOPER APPARATUS
David L. Zick, Johnson City, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Dec. 21, 1977, Ser. No. 863,336
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

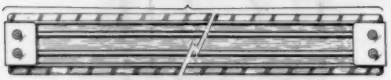


254,311
MICROSCOPE ILLUMINATOR HOUSING
Richard L. Morgan, Cincinnati, Ohio, and Richard E. Feinbloom, New York, N.Y., assignors to Designs for Vision, Inc., New York, N.Y.
Filed Aug. 3, 1977, Ser. No. 821,548
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—57

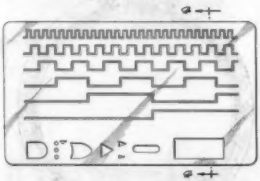


254,312
BANJO RESONATOR FLANGE
Geoffrey H. Stelling, 8815 Kenwood Dr., Spring Valley, Calif. 92077
Filed Apr. 27, 1977, Ser. No. 791,593
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

254,313
DRAFTING PARALLEL
Mark B. Dundore, 12 Westbrook Dr., Akron, Pa. 17501
Filed Nov. 21, 1977, Ser. No. 853,628
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35

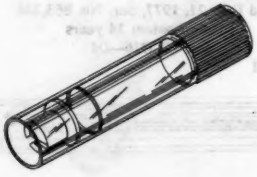


254,314
ELECTRONIC TIMING AND LOGIC DRAFTING TEMPLATE
John M. Denslow, 10833 Braddock Dr., Culver City, Calif. 90230
Filed Apr. 28, 1978, Ser. No. 900,936
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—39

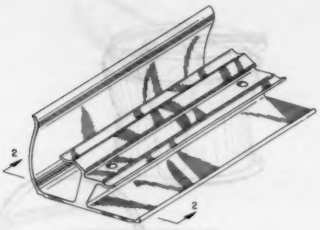


254,315
PEN
Alain Carre, 30, Avenue du Docteur Arnold Netter, Paris, France, assignor to Waterman S.A.
Filed Apr. 7, 1977, Ser. No. 785,761
Claims priority, application France, Oct. 14, 1976, 76 75144
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

254,316
INK CARTRIDGE WITH RUPTURABLE SEALING ELEMENT
Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.
Filed Apr. 27, 1978, Ser. No. 900,629
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—54



254,317
DESK CADDY
Carmen P. Chicone, 6767 Tanglewood Dr., Youngstown, Ohio 44512
Filed Mar. 3, 1978, Ser. No. 887,801
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75

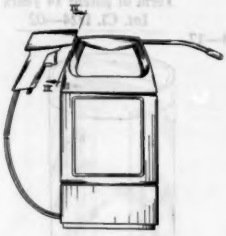


254,318
TOY PARACHUTE FRAME
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed May 31, 1977, Ser. No. 801,629
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—91

254,319
SIMULATIVE TOY TYPEWRITER
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 14, 1977, Ser. No. 860,486
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—127

254,320
TOY TRUCK CAB
Barry S. Herstein, Spring Valley, N.Y., assignor to Buddy L Corporation, New York, N.Y.
Filed Oct. 3, 1977, Ser. No. 838,925
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

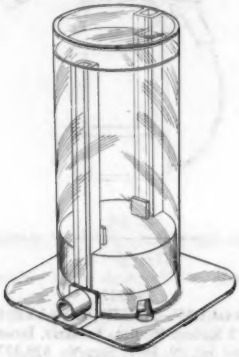
254,321
PORTABLE POWERED SPRAYER
William E. Sidor, Jenison; Russell O. Blanchard, Marshall, both of Mich., and William E. Bartasevich, Jr., Kent, Ohio, assignors to Leigh Products, Inc., Coopersville, Mich.
Filed Jul. 11, 1977, Ser. No. 814,153
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

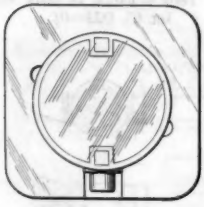


254,322
VOLUME-CONTROL VALVE
Jerome Koenig, 3 Kadesh Barnea, Tel Aviv, Israel
Filed Jul. 29, 1977, Ser. No. 820,327
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

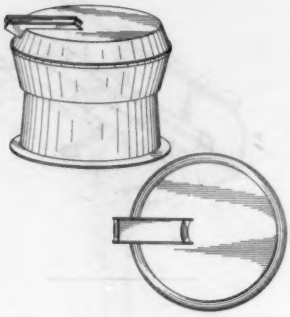
254,323
BATHTUB
William N. Powell, 317 Oakway Mall, Eugene, Oreg. 97401
Filed Sep. 13, 1978, Ser. No. 942,175
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

254,324
RESPIRATORY EXERCISER AND THE LIKE
William H. Thead, Jr., 2259 Marann Dr., NE., Atlanta, Ga. 30345
Filed Sep. 2, 1977, Ser. No. 830,368
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

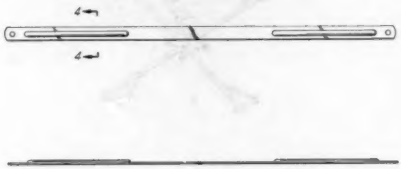




254,325
HOUSING FOR CENTRIFUGAL CASTING MACHINE
William F. Goodrich; Robert C. Ingersoll, both of Adrian, Mich., and Donald W. Doman, Janesville, Wis., assignors to Dick Blick Company
Filed Apr. 22, 1977, Ser. No. 789,935
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D24—22



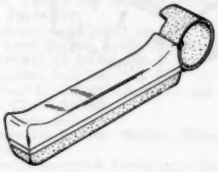
254,326
TONGUE CLEANING DEVICE
Venkatesh R. Nevrekar, 805 E. Midland, Shawnee, Okla. 74801
Filed Jun. 16, 1977, Ser. No. 807,049
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—28



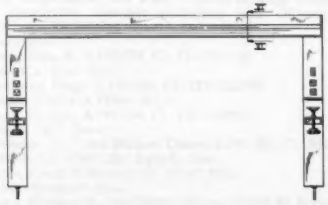
254,327
KIOSK
Jose R. P. Tasse, P.O. Box 1842, Carolina, P.R. 00630
Filed Oct. 13, 1978, Ser. No. 951,280
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—26

254,328
HAIR DRYER
John L. Benty, Sands Point, N.Y., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 11, 1977, Ser. No. 814,792
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

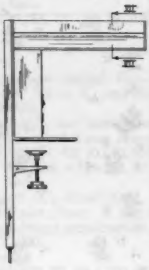
254,329
FINGERNAIL POLISHING TOOL
Moriko Tsukamoto, 2-3 chome, and Chihiro Tsukamoto, 1-3 chome, both of Toyotama-kita, Nerima-ku, Tokyo, Japan
Filed Sep. 27, 1977, Ser. No. 836,934
Claims priority, application Japan, Mar. 29, 1977, 52-11044
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—59



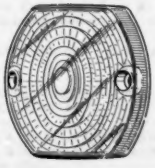
254,330
FLUORESCENT DESK LAMP
Sylvan R. Shemitz, 145 Orange Ave., West Haven, Conn. 06516
Filed Jul. 11, 1977, Ser. No. 814,471
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



254,331
FLUORESCENT DESK LAMP
Sylvan R. Shemitz, 145 Orange Ave., West Haven, Conn. 06516
Filed Jul. 11, 1977, Ser. No. 814,786
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F

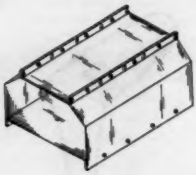


254,332
LENS FOR A LAMP
Koji Nakano, Kawasaki, and Yoshikazu Maeda, Tokyo, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Apr. 12, 1978, Ser. No. 895,783
Claims priority, application Japan, Oct. 19, 1977, 52-041542
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A

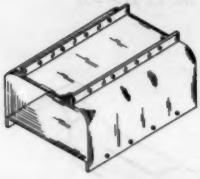


254,333
PAPER TISSUE
Donald T. Appleman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 19, 1977, Ser. No. 826,105
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B

254,334
COMBINED NEWSPAPER DELIVERY BOX AND MAILBOX SUPPORT
Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643
Filed Oct. 21, 1977, Ser. No. 844,513
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—29



254,335
COMBINED NEWSPAPER DELIVERY BOX AND MAILBOX SUPPORT
Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643
Filed Oct. 21, 1977, Ser. No. 844,514
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—29



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TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Nycotron: *See—*
Grimsrud, Lars, 4,190,536, Cl. 210-93.000.

Abeta, Sadaharu: *See—*
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Abrams, Stanton: *See—*
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Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., to ICI Australia Limited. Cementitious composition containing asbestos fibres and prepared using a surfactant. 4,190,456, Cl. 106-99.000.

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Achenbach, Karl; and Turk, Gunter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for treating air-borne (metallic) dusts containing silicon dioxide to form precipitated silicic acids and silicates. 4,190,632, Cl. 423-118.000.

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Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., 4,189,897, Cl. 53-434.000.

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Body, Richard H.; and Evers, Edwin W., 4,190,332, Cl. 351-13.000.

Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, to Shionogi & Co., Ltd. Process for the production of lower alkyl 2-chloro-2-hydroxyiminoacetates. 4,190,728, Cl. 560-168.000.

Adam, Alain C., to Du Pont de Nemours, E. I., and Company. Method of packaging unvulcanized neoprene. 4,190,156, Cl. 206-447.000.

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Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, 4,189,813, Cl. 29-156.80R.

Aeroflex Laboratories, Inc.: *See—*
Belfield, Robert E.; Gilbert, Chester L.; and Bickham, Euland M., 4,190,227, Cl. 248-636.000.

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Swanson, Kenneth R.; and Beilfuss, Richard J., 4,190,223, Cl. 248-68.00R.

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Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.

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Wagensonner, Eduard, 4,190,343, Cl. 354-227.000.

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Kluczynski, Achim; and Tabel, Johannes, 4,190,216, Cl. 242-194.000.
Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, 4,189,803, Cl. 15-302.000.
Thate, Kurt, 4,190,185, Cl. 226-172.000.

Ahlgren, Stig B., to Prisma Neon AB. Device at display arrangement. 4,189,859, Cl. 40-505.000.

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Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., to Acraloc Corporation; and Rheem Manufacturing Company. High speed evacuation chamber packaging and clipping machine. 4,189,897, Cl. 53-434.000.

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Kayser, John P., 4,190,075, Cl. 137-329.100.

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Sakakibara, Naoji, 4,190,026, Cl. 123-102.000.

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Olsson, Torsten, 4,190,494, Cl. 176-76.000.

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Lachonius, Leif; and Becker, Dieter, 4,190,301, Cl. 308-8.200.

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Loepfe, Erich, 4,189,841, Cl. 33-147.00L.

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Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, 4,189,942, Cl. 73-356.000.

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Alcamo, John M.: *See—*
Williamson, Clifton L.; Hocker, Harvey L.; and Alcamo, John M., 4,189,793, Cl. 4-228.000.

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Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., 4,190,103, Cl. 165-120.000.

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Kramer, Marvin, 4,190,691, Cl. 428-67.000.

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Woron, Robert P., 4,189,970, Cl. 84-1.190.

Alles, Harold G., to Bell Telephone Laboratories, Incorporated. Multidevice position digital encoder. 4,190,826, Cl. 340-365.00S.

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Bedell, John R., 4,190,095, Cl. 164-87.000.
Cachia, Joseph M., 4,190,212, Cl. 242-107.000.
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Diamond, Steven E.; and Mares, Frank, 4,190,595, Cl. 260-429.00R.
Long, E. David, 4,190,022, Cl. 123-32.0EF.
Marshall, Robert M.; and Dardoufas, Kimon C., 4,190,545, Cl. 252-8.750.
Masilamani, Divakaran; and Rogic, Milorad M., 4,190,612, Cl. 585-378.000.
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Zajichek, William J., 4,189,952, Cl. 74-477.000.

Allread, John J.; McManamy, Thomas A.; and Peter, Bruno E., to Grede Foundries Inc. Apparatus for making foundry cores. 4,190,097, Cl. 164-343.000.

Allsop, James D. Ski pole mounting assembly and method. 4,190,166, Cl. 211-60.00R.

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Almer, Bengt O.; and Gidlof, Karl G. Device in concrete blocks. 4,190,380, Cl. 404-6.000.

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Hedger, Bruce W., 4,190,461, Cl. 134-1.000.

Alter, David L., to Semi-Mask, Inc. Compact wide-range digital stretch gauge. 4,189,842, Cl. 33-149.00J.

Aluminum Company of America: *See—*
Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., 4,190,186, Cl. 228-15.100.

Alza Corporation: *See—*
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AM International, Inc.: *See—*
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Orita, Naoki, 4,190,143, Cl. 192-145.000.

Amana Refrigeration, Inc.: *See—*
Foerstner, Richard A., 4,190,756, Cl. 219-10.55B.

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Gordon, Harry W.; and Amanat, Sharif, 4,190,064, Cl. 132-7.000.

Amberg, Arthur A.; and Zetterlund, Ture R., to International Harvester Company. Vehicle cab temperature control system. 4,189,987, Cl. 98-2.140.

Ambrose, Charles J. Container for delicate articles. 4,190,158, Cl. 206-522.000.

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Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, 4,190,694, Cl. 428-212.000.

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Liautaud, James P., 4,190,839, Cl. 343-715.000.
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Klein, Albert J.; Chen, Chiou-Tse; and Kohl, Lou, 4,190,440, Cl. 75-211.000.

Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, 4,190,477, Cl. 156-244.110.
American Cyanamid Company: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.
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Sarantakis, Dimitrios, 4,190,575, Cl. 260-112.50S.
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Hofstetter, Jack H., 4,189,789, Cl. 4-144.100.
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Schulte, Rudolf R., 4,190,040, Cl. 128-1.00R.
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American Optical Corporation: *See*—
Schultz, Richard P., 4,190,313, Cl. 350-84.000.
Siegmund, Walter P., 4,190,347, Cl. 355-1.000.
American Safety Razor Company: *See*—
Iten, Clemens A.; and Campbell, Christopher J., 4,189,829, Cl. 30-151.000.
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Crossman, Philip E.; and Van Ryn, Arthur L., 4,189,876, Cl. 52-9.000.
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Amminger, William L. Regenerative turbine. 4,190,399, Cl. 415-116.000.
AMP Incorporated: *See*—
Bright, Edward J.; Cherian, Gabriel B.; and Scheingold, William S., 4,190,310, Cl. 339-45.00R.
Litehizer, Melvin P., Jr., 4,189,799, Cl. 7-107.000.
AMSTED Industries Incorporated: *See*—
Hirs, Gene, 4,190,533, Cl. 210-80.000.
Andersen, John A.; and Cole, James K., to United States of America, Energy. Accident resistant transport container. 4,190,160, Cl. 206-591.000.
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Andoh, Shizuo: *See*—
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Andrae, Herbert H. Contract bridge device. 4,190,253, Cl. 273-148.000.
Andre, L. George: *See*—
Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., 4,189,897, Cl. 53-434.000.
Andrew Adams Developing Corporation: *See*—
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,189,822, Cl. 29-453.000.
Andrews, Boley A.: *See*—
Moss, Charles A.; and Andrews, Boley A., 4,190,179, Cl. 221-299.000.
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Antipenkov, Boris A.: *See*—
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Aoki, Junji: *See*—
Washizuka, Isamu; Aoki, Junji; and Tomino, Tadashi, 4,189,912, Cl. 58-152.00R.
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., to Vsesojuzny Nauchno-Isslekovatelsky Institut Monokristallov Stsintillyatsionnykh Materialov I Osobo Chistykh Khimicheskikh Veschestv. Apparatus for pulling single crystals from melt. 4,190,630, Cl. 422-249.000.
Appleton, Arthur I.; Liljequist, Jon L.; and Ylagan, Carlos J., to Appleton Electric Company. Electrical cable connector with cam lock. 4,190,222, Cl. 248-56.000.
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Arnaud, Gerard, to Eaton Corporation. Dispensing device. 4,190,181, Cl. 222-456.000.
Arnold, Dan M.; and Smith, Harry D., Jr., to Texaco Inc. Determining the water cut and water salinity in an oil-water flow stream by measuring the sulfur content of the produced oil. 4,190,768, Cl. 250-270.000.
Arnold, James F. Spaced weight relieved drill collar string. 4,190,122, Cl. 175-320.000.
Arora, Ajit S.: *See*—
Tapper, Robert; Diamond, Arthur S.; and Arora, Ajit S., 4,190,056, Cl. 128-630.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Doi, Yoshinao; Kohno, Mitsuo; and Yoshitake, Katsumi, 4,190,707, Cl. 429-254.000.
Ogawa, Shinsaku; Yoshida, Mitsuo; and Shiroki, Hiroyuki, 4,190,505, Cl. 204-98.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Arai, Akihiro, 4,190,339, Cl. 354-156.000.
Arai, Yasunori, 4,190,324, Cl. 350-226.000.
Ogawa, Ryota; and Itoh, Takayuki, 4,190,323, Cl. 350-184.000.
Asaka, Toshifumi: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, 4,190,581, Cl. 260-239.100.
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, to Sony Corporation. Amorphous magnetic alloy. 4,190,438, Cl. 75-123.00B.
Asoiants, Grigory B.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Astec Industries, Inc.: *See*—
Brock, James D.; and Mize, Erbie G., 4,190,370, Cl. 366-25.000.
Atari, Inc.: *See*—
Kindig, Cleon V., 4,190,252, Cl. 273-127.00R.
Atkinson, Gordon E.; and Tregillus, Kenneth C., to Vernay Laboratories, Inc. Drip irrigation system. 4,190,206, Cl. 239-271.000.
Atlantic Richfield Company: *See*—
Hawley, Wilbur W., 4,189,881, Cl. 52-220.000.
Atomic Energy of Canada Limited: *See*—
Butler, John P.; and Hammerli, Martin, 4,190,515, Cl. 204-266.000.
Auger, Bernard; Plattier, Marcel; and Teisseire, Paul J., to Societe Anonyme Roure Bertrand Dupont. Esters of cyclohexene, odoriferous compositions containing said esters and process for the preparation thereof. 4,190,561, Cl. 252-522.00R.
Aunt Nellie's Foods, Inc.: *See*—
Pleus, Edwin F., 4,190,678, Cl. 426-478.000.
Auto Specialties Manufacturing Company: *See*—
Potter, Robert H., 4,189,821, Cl. 29-432.000.
Automobiles Peugeot: *See*—
Sigwald, Jacques; and Achard, Michel, 4,190,031, Cl. 123-119.00A.
Avco Corporation: *See*—
O'Connor, William M., 4,190,217, Cl. 244-53.00B.
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., to Xerox Corporation. Facetted reflector. 4,190,355, Cl. 355-71.000.
Avina, Raymond; and Merrell, Patrick F., to International Business Machines Corporation. Disk drive assembly. 4,190,870, Cl. 360-98.000.
Ayres, James L.: *See*—
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,190,577, Cl. 260-123.500.
B. F. Goodrich Company, The: *See*—
Lai, John T.; and Son, Pyong N., 4,190,571, Cl. 260-45.80N.
Tucker, Harold A., 4,190,582, Cl. 260-239.30R.
Westerman, Ira J., 4,190,562, Cl. 260-17.4UC.
Bachand, Ernest C., to Pioneer Cover-All, Inc. Portable screening plant. 4,190,526, Cl. 209-245.000.
Backus, Harold A., to NL Industries, Inc. Adjustable hinge installation. 4,189,805, Cl. 16-130.000.
Baermann, Max. Plastic bonded permanent magnet and method of making same. 4,190,548, Cl. 252-62.540.
Bahl, Surinder K.; and Leach, Gale L., to Mead Corporation, The. Gold etchant composition and method. 4,190,489, Cl. 156-664.000.
Bailey, Lonnie E. Light display means. 4,190,312, Cl. 350-4.200.
Bailey, Paul F. Trephine instrument for use in cornea removal and transplant. 4,190,050, Cl. 128-305.100.
Bains, Gurdip S.; and Martin, Niles J., to Westinghouse Electric Corp. Panel joint. 4,189,890, Cl. 52-584.000.

Baker International Corporation: *See*—
Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., 4,190,107, Cl. 166-120.000.
Baldwin, Charles W.: *See*—
Stewart, William F.; and Baldwin, Charles W., 4,189,865, Cl. 47-14.000.
Baldwin, John R., to Mustang Services Company. Pipe thread gauge. 4,189,843, Cl. 33-199.00R.
Ball, Rowland E., to Borg-Warner Corporation. Multiple stage pump. 4,190,395, Cl. 415-61.000.
Ballin, Gene. Combination mounting frame and film for a window. 4,189,880, Cl. 52-202.000.
Bally Manufacturing Corporation: *See*—
Burnside, Walter M., 4,190,066, Cl. 133-4.00R.
Barabash, Valery F.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Barfield, Charles R., Jr.: *See*—
Cunningham, Bruce B.; and Barfield, Charles R., Jr., 4,190,360, Cl. 355-89.000.
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Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.
Barr, Douglas R.: *See*—
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,190,577, Cl. 260-123.500.
Barry, John D. A. Bread baking. 4,189,992, Cl. 99-327.000.
Bartels, Harold U., to Bourns Medical Systems, Inc. Noise reducing exhalation valve and diaphragm. 4,190,045, Cl. 128-205.240.
Bartley, Francis A.: *See*—
Goodbary, Edgar R.; and Bartley, Francis A., 4,190,265, Cl. 280-716.000.
Barton, Hugh M., Jr., to Phillips Petroleum Company. Introduction and selective removal of debilitating agent for permeability correction. 4,190,109, Cl. 166-270.000.
Barton, Sterling C.: *See*—
Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., 4,190,829, Cl. 340-606.000.
Baruffa, Olindo, to Mefina S.A. Zigzag stitch sewing machine. 4,190,008, Cl. 112-158.00B.
Barwell, John H.; and Wielesiuk, Aleksander. Method and apparatus for applying a rubber layer to a cylindrical workpiece. 4,190,684, Cl. 427-194.000.
BASF Aktiengesellschaft: *See*—
Kiehs, Karl; Schrepfer, Hans J.; and Adolphi, Heinrich, 4,190,650, Cl. 424-204.000.
Kroker, Ruprecht; Sander, Hans; and Gausepohl, Hermann, 4,190,569, Cl. 260-31.600.
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.
Bass, Merlyn D.: *See*—
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.
Basta, Thomas P., to Tektronix, Inc. Low-profile test clip adapter. 4,190,311, Cl. 339-75.0MP.
Battles, James E.: *See*—
Eberhart, James G.; and Battles, James E., 4,189,827, Cl. 29-623.100.
Baudin, Pol: *See*—
De Boel, Marcel; and Baudin, Pol, 4,190,698, Cl. 428-334.000.
Bauer, Heinz; Becker, Burckhard; and Gedig, Alfred, to C Rob Hammerstein GmbH. Device for adjusting vertical and inclined positions of a vehicle seat. 4,190,225, Cl. 248-394.000.
Bauer, Heinz: *See*—
Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, 4,189,957, Cl. 74-535.000.
Bauer, Kurt; and Molleken, Reiner, to Haarmann & Reimer GmbH. Process for the preparation of 3,4-methylenedioxymandelic acid. 4,190,583, Cl. 260-340.50R.
Bauer, Robert, to Miles Laboratories, Inc. Device for detecting serum bilirubin. 4,190,419, Cl. 23-230.00B.
Bauer, William J. Method and apparatus for controlling flow of liquid in gravity flow conduits. 4,190,070, Cl. 137-15.000.
Baum, Jorg P., to Verfahrenstechnik Dr. Ing. Kurt Baum. Apparatus for treating refinery waste gases. 4,190,237, Cl. 266-80.000.
Baum, Werner; and Munding, German, to Messerschmitt-Bolkow-Blohm GmbH. Thermal drilling device. 4,190,121, Cl. 175-14.000.
Baumann, Gert F.: *See*—
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.
Bausch, Hans M. Pellet dispenser for dental purpose. 4,190,177, Cl. 221-56.000.
Bausch & Lomb Incorporated: *See*—
Clark, James A., 4,190,154, Cl. 206-438.000.
Baxter Travenol Laboratories, Inc.: *See*—
Kulle, Lee K.; and Rudzena, William L., 4,190,171, Cl. 215-329.000.
Ruschke, Ricky R., 4,190,426, Cl. 55-185.000.
Virag, Robert A., 4,190,046, Cl. 128-200.210.
Bayer Aktiengesellschaft: *See*—
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.
Larbig, Wolfgang, 4,190,510, Cl. 204-180.00R.
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,190,710, Cl. 521-89.000.
Noll, Klaus; and Pedain, Josef, 4,190,566, Cl. 260-29.2TN.
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.
Schutze, Detlef-Ingo; and Wunderlich, Klaus, 4,190,726, Cl. 546-27.000.
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.
Bayley, Allan E., to Hughes Aircraft Company. Gas laser with resistive strip arrangement for starting enhancement. 4,190,810, Cl. 331-94.5PE.
Beall, Nelson J.: *See*—
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.
Beard, Eugene R. Screw lock for interlocking sliding door and windows. 4,190,272, Cl. 292-251.000.
Beck, Earl, to Unit Rig & Equipment Co. Dual steering system for off-highway vehicles. 4,190,130, Cl. 180-133.000.
Becker, Burckhard: *See*—
Bauer, Heinz; Becker, Burckhard; and Gedig, Alfred, 4,190,225, Cl. 248-394.000.
Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, 4,189,957, Cl. 74-535.000.
Becker, Dieter: *See*—
Lachonius, Leif; and Becker, Dieter, 4,190,301, Cl. 308-8.200.
Becker, Larry W., to Betz Laboratories, Inc. Oligomeric ester chain condensates of substituted 1-hydroxy-1,1-diphosphonic acid. 4,190,615, Cl. 260-931.000.
Becker, Stephen P., to Fargo Manufacturing Company, Inc. Dual head fastener. 4,189,976, Cl. 85-9.00R.
Beckman Instruments, Inc.: *See*—
Chulay, Steven J., 4,190,195, Cl. 233-26.000.
Beckman, William J., Jr.: *See*—
Pederson, Jerard M.; and Beckman, William J., Jr., 4,190,543, Cl. 210-332.000.
Becton, Dickinson Electronics Company: *See*—
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., 4,190,749, Cl. 200-11.0TW.
Bedell, John R., to Allied Chemical Corporation. Chill roll casting of continuous filament. 4,190,095, Cl. 164-87.000.
Bedo, Ilona: *See*—
Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, 4,190,020, Cl. 119-14.080.
Behringwerke Aktiengesellschaft: *See*—
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.
Beilfuss, Richard J.: *See*—
Swanson, Kenneth R.; and Beilfuss, Richard J., 4,190,223, Cl. 248-68.00R.
Beirute, Robert M., to Western Company of North America, The. Method of cementing wellbores using high temperature cement mud spacer. 4,190,110, Cl. 166-291.000.
Bejting, Anders M. T.; and Wern, Lars A. Alphanumeric terminal having an optoelectric converter and an associated mono-pulse generating circuit. 4,190,833, Cl. 340-707.000.
Belfield, Robert E.; Gilbert, Chester L.; and Bickham, Euland M., to Aeroflex Laboratories, Inc. Vibration isolator and method for manufacturing same. 4,190,227, Cl. 248-636.000.
Beljanski, Mirko. Polyribonucleotides capable of promoting the genesis of leucocytes and blood platelets. 4,190,649, Cl. 424-180.000.
Bell, Guido: *See*—
Tihanyi, Jenoe; and Bell, Guido, 4,190,850, Cl. 357-23.000.
Bell & Howell Company: *See*—
LaRue, Mervin W., Jr., 4,190,353, Cl. 355-24.000.
Bell, Robert E., to Essex Group, Inc. Lamp outage indicator circuit. 4,190,830, Cl. 340-642.000.
Bell Telephone Laboratories, Incorporated: *See*—
Alles, Harold G., 4,190,826, Cl. 340-365.00S.
Berreman, Dwight W., 4,190,330, Cl. 350-331.000.
Bruning, John H., 4,190,352, Cl. 355-19.000.
Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., 4,190,747, Cl. 179-170.0NC.
Knowlton, Kenneth C., 4,190,896, Cl. 364-859.000.
Logan, Ralph A.; and Tsang, Won-Tien, 4,190,813, Cl. 331-94.50H.
Miller, Gabriel L.; and Robinson, David A. H., 4,190,799, Cl. 324-239.000.
Bellofatto, Oreste, to Snamprogetti S.p.A. Converting solar energy into electric power. 4,189,922, Cl. 60-641.000.
Ben-Dor, Monique: *See*—
Gale, Robert M.; Ben-Dor, Monique; and Keller, Nancy, 4,190,642, Cl. 424-19.000.
Bendall, Wilfrid H. Automatic clutch. 4,190,138, Cl. 192-43.000.
Bendell, Sidney L., to RCA Corporation. Video image tube highlight suppression circuit. 4,190,865, Cl. 358-219.000.
Bendix Corporation, The: *See*—
Kosakowski, Henry R., 4,190,891, Cl. 364-606.000.
Taplin, Lael B., 4,190,029, Cl. 123-119.00A.

Bennet, Robert A. Liquid dispenser. 4,190,180, Cl. 222-207.000.

Bennett, George T.; and Brucken, Byron L., to General Motors Corporation. Electromagnetic clutch. 4,190,141, Cl. 192-84.00C.

Bentley, John P. Inflatable seat cushion and body support assembly. 4,190,286, Cl. 297-284.000.

Berdan, Betty L.; and Luce, Betty M., to Gould Inc. Method of making a printed circuit board having mutually etchable copper and nickel layers. 4,190,474, Cl. 156-151.000.

Berg, Clyde. Geothermal energy recovery. 4,189,923, Cl. 60-641.000.

Bergman, Janice M.: *See—*
Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., 4,190,429, Cl. 71-67.000.

Berlioux, Jacques, to Societe Anonyme Francaise du Ferodo. Torsion-damping assemblies with two-part hubs e.g. for friction clutches. 4,190,142, Cl. 192-106.200.

Berreman, Dwight W., to Bell Telephone Laboratories, Incorporated. Variable focus liquid crystal lens system. 4,190,330, Cl. 350-331.000.

Berry, George A., to International Computers Limited. Fastening device. 4,190,375, Cl. 403-7.000.

Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., to Phillips Petroleum Company. Passivation of metals on cracking catalysts with an antimony tris (hydrocarbyl sulfide). 4,190,552, Cl. 252-411.00R.

Besik, Ferdinand. Apparatus for on-site renovation of sanitary waters. 4,190,539, Cl. 210-195.400.

Bethlehem Steel Corporation: *See—*
Hitzrot, Henry W., Jr., 4,190,422, Cl. 51-309.000.

Betz Laboratories, Inc.: *See—*
Becker, Larry W., 4,190,615, Cl. 260-931.000.

Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., to Gifford-Hill & Company, Inc. Self-correcting linearly movable irrigation system. 4,190,068, Cl. 137-1.000.

Beusen, Gerardus L. Fluid heater. 4,190,035, Cl. 126-99.00A.

Bevernitz, Kurt J.: *See—*
Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., 4,190,429, Cl. 71-67.000.

Beziat, Bernard, to Societe Nouvelle des Echafaudages Tubulaires Mills. Assembly elements, inter alia for scaffolding. 4,189,810, Cl. 24-249.00R.

BFG Glassgroup: *See—*
De Boel, Marcel; and Baudin, Pol, 4,190,698, Cl. 428-334.000.

Bhattacharyya, Arup; and Wiedman, Francis W., III, to International Business Machines Corporation. Method for making a bipolar transistor structure utilizing self-passivating diffusion sources. 4,190,466, Cl. 148-1.500.

Bhattacherjee, Parimal: *See—*
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,190,673, Cl. 424-324.000.

Bibby, Noel, to Noel Bibby Limited. Waterproof inwardly facing garment seams produced by high frequency welding. 4,190,010, Cl. 112-419.000.

Bickham, Euland M.: *See—*
Belfield, Robert E.; Gilbert, Chester L.; and Bickham, Euland M., 4,190,227, Cl. 248-636.000.

Bielefeldt, Ernst-August, to Messerschmitt-Boelkow-Blohm GmbH. Apparatus for converting of spin flow energy into pressure energy. 4,190,078, Cl. 137-561.00R.

Bierbaum, Dieter: *See—*
Teschner, Wolfgang; and Bierbaum, Dieter, 4,190,498, Cl. 202-262.000.

Bijen, Jan M. J. M.; and Kleinjans, Peter A. M., to Stamicarbon, B.V. Process for the manufacture of shaped products from calcium sulphate dihydrate. 4,190,455, Cl. 106-98.000.

Bingham, David, to Intersil, Inc. Commutating autozero amplifier. 4,190,805, Cl. 330-9.000.

Bio-Rad Laboratories, Inc.: *See—*
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.

Biorex Laboratories Limited: *See—*
Vanstone, Anthony E.; and Maile, Graham K., 4,190,671, Cl. 424-317.000.

Bird Machine Company, Inc.: *See—*
Amero, Clifford L., 4,190,194, Cl. 233-7.000.

Bishop, Arthur E. Rack and pinion steering gear for automotive vehicles. 4,189,955, Cl. 74-498.000.

Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Process for splitting the L-(−)-α-phenylethylamine salt of D-(−)-α-azidophenylacetic acid. 4,190,592, Cl. 260-349.000.

Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S. Tank furnace for hot-dip metal coating. 4,190,017, Cl. 118-74.000.

Black & Decker Inc.: *See—*
Sauerwein, William D.; and Walton, Richard E., II, 4,190,781, Cl. 310-239.000.

Black Diamond Service Company, Inc.: *See—*
O'Neal, Winston R.; and Richardson, Stephen L., 4,190,116, Cl. 173-38.000.

Black, Robert P.: *See—*
Jenkins, Hugh N.; and Black, Robert P., 4,190,014, Cl. 116-266.000.

Blay, George A., to Celanese Corporation. Process for dehalogenation and/or prevention of halogenation. 4,190,606, Cl. 260-601.00R.

Blessington, Bruce A.: *See—*
Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., 4,189,886, Cl. 52-302.000.

Bleyer, Franz, to Peter Wukovich OHG. Folded seam closing machine. 4,189,935, Cl. 72-452.000.

Blitzer, Jacob H., Jr. Decorative ceiling system. 4,189,888, Cl. 52-484.000.

Boast, Gordon E., to Coal Industry (patents) Limited. Mining machines with cutter chain tensioning means. 4,190,295, Cl. 299-43.000.

Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, to Forschungs Institut Fuer Textiltechnologie. Radiation treatment of high-polymer textile materials. 4,190,623, Cl. 264-22.000.

BOC Limited: *See—*
Armond, John W.; Webber, David A.; and Smith, Kenneth C., 4,190,424, Cl. 55-58.000.

Body, Richard H.; and Evers, Edwin W., to Acuity Systems, Incorporated. Method and apparatus for controlling visual refractive state of the eye. 4,190,332, Cl. 351-13.000.

Boeing Commercial Airplane Company: *See—*
Lynn, William F.; and Walker, Gordon M., 4,190,302, Cl. 308-36.100.

Boesch, William J.; and Maurer, Gernant E., to Special Metals Corporation. Low thermal expansion nickel-iron base alloy. 4,190,437, Cl. 75-122.000.

Bohms, Herbert: *See—*
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.

Boling, Norman L., to Owens-Illinois, Inc. Luminescent solar collector structure. 4,190,465, Cl. 136-89.0FC.

Bolza-Schunemann, Hans B., to Koenig & Bauer Aktiengesellschaft. Gear folder. 4,190,242, Cl. 270-50.000.

Bommart, Patrick, to Delachaux, C. Mould for the metallothermic welding of metal items. 4,190,228, Cl. 249-86.000.

Bond, Jerome S., to Dayco Corporation. Package construction for coilable material and method of packaging and dispensing same. 4,190,214, Cl. 242-138.000.

Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, to Societe Francaise d'Electrometallurgie "Sofrem". Thermal processes for the production of magnesium. 4,190,434, Cl. 75-10.00R.

Booth, Charles L., to Du Pont de Nemours, E. I., and Company. Sodium ion conducting sodium aluminum borate glasses. 4,190,500, Cl. 204-1.00R.

Borg-Warner Corporation: *See—*
Ball, Rowland E., 4,190,395, Cl. 415-61.000.
Holdeman John W., 4,189,960, Cl. 74-781.00R.

Bormioli, Giorgio. Connector device for the quick coupling of floating hoses. 4,190,086, Cl. 138-89.000.

Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased (by Meng, Ilse H. F., heiress); and Seuter, Friedel, to Bayer Aktiengesellschaft. Anti-thrombotic 1,2-benzisothiazolin-3-ones. 4,190,663, Cl. 424-267.000.

Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., to Lever Brothers Company, Inc. Particulate absorbant material surface treated with polyether to improve dispersibility in blood. 4,190,563, Cl. 260-17.4GC.

Boston University, Trustees of: *See—*
Sears, Barry D., 4,190,628, Cl. 422-61.000.

Boucher, Raymond W., to Hedstrom Co. Foldable play gym. 4,190,283, Cl. 297-77.000.

Bourlier, Claude, to Societe Hygiaphone V.B. Counter window for use in particular in chemist's shops. 4,190,003, Cl. 109-19.000.

Bourns Medical Systems, Inc.: *See—*
Bartels, Harold U., 4,190,045, Cl. 128-205.240.

Bowen, Robert F.; and Knight, Philip A., Jr., to Raytheon Company. Microwave appliance valve. 4,190,077, Cl. 137-550.000.

Bowers, John J.: *See—*
Lecklider, Thomas H.; and Bowers, John J., 4,190,797, Cl. 324-61.00R.

Box, Theodor M. Beverage bottle case. 4,190,172, Cl. 220-21.000.

Boyd, Eugene J., to United States Tobacco Company. Snuff can and the like. 4,190,170, Cl. 215-307.000.

Brabetz, Bernhard; and Hackl, Helmut, to Siemens Aktiengesellschaft. Method of producing holes free of accretions in circuit boards made of plastic. 4,190,386, Cl. 408-1.00R.

Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John. Shutter for rotating source CT scanner. 4,190,773, Cl. 250-445.00T.

Bradshaw, David R. Hot dog bun pan. 4,190,229, Cl. 249-124.000.

Brandes, Harry, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. De-curling device for printing presses. 4,190,245, Cl. 271-278.000.

Braun, Anton. Compressor. 4,189,958, Cl. 74-606.00R.

Bray, Donald T.: *See—*
Tondreau, Raymond A.; and Bray, Donald T., 4,190,537, Cl. 210-98.000.

Brendley, William H.: *See—*
Martorano, Richard; and Brendley, William H., 4,190,693, Cl. 428-209.000.

Brennan, H. George. Therapeutic bandage with removable hot or cold packs. 4,190,054, Cl. 128-402.000.

Brenner, Gerald S.: *See—*
DeMarco, Joseph; and Brenner, Gerald S., 4,190,655, Cl. 424-250.000.

Bresell, Raymond J. Sanitary protective sheath with disposable absorbent liner for tobacco pipe stem. 4,190,150, Cl. 206-244.000.

Brettle, Jack; and Jackson, Norman F., to Plessey Handel und Investments A.G. Light transmission guides. 4,190,315, Cl. 350-96.120.
Bricker, Daniel W.: *See—*
Shaffer, John W.; and Bricker, Daniel W., 4,190,413, Cl. 431-362.000.
Bridgestone Tire Company Limited: *See—*
Yabe, Toshinori, 4,190,482, Cl. 156-403.000.
Bright, Edward J.; Cherian, Gabriel B.; and Scheingold, William S., to AMP Incorporated. Ejection device for a electronic package connector. 4,190,310, Cl. 339-45.00R.
Bristol Products Inc.: *See—*
Colten, Jerrold L., 4,190,761, Cl. 219-213.000.
British Petroleum Company Limited, The: *See—*
Kulik, Stanley; and Smith, Anthony M., 4,190,546, Cl. 252-49.600.
Treadaway, Michael F., 4,189,866, Cl. 47-58.000.
British Screw Company Limited: *See—*
Silverwood, Colin, 4,189,979, Cl. 85-74.000.
Brock, George F., Jr. Flexible rake. 4,189,908, Cl. 56-400.170.
Brock, James D.; and Mize, Erbie G., to Astec Industries, Inc. Asphalt plant with improved temperature control system. 4,190,370, Cl. 366-25.000.
Brodbeck, Robert. Motor controlled mirror positioning apparatus. 4,190,326, Cl. 350-289.000.
Brokken-Zijp, Josephina C. M.; and Reinders, Foppe J., to Shell Oil Company. Photogalvanic cell comprising complexing agents. 4,190,705, Cl. 429-111.000.
Bronkema, James W.; and Hoeksema, Norman L., to Unique Tool & Die Co. Automatic loading and unloading apparatus for press. 4,190,408, Cl. 425-145.000.
Brookhyser, Byron B., to Weyerhaeuser Company. Unloading apparatus for multi-opening work station. 4,189,851, Cl. 34-236.000.
Brown, John E., to West & Son (Engineers) Limited. Bushes. 4,190,299, Cl. 308-3.500.
Brown, Joseph P.: *See—*
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,190,716, Cl. 525-334.000.
Brown & Root, Inc.: *See—*
Fernandez, Ramon J.; and Kahl, John S., 4,190,072, Cl. 137-236.00S.
Schmitz, Thomas R.; Srivastav, Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., 4,190,382, Cl. 405-159.000.
Brown, Theodore G. Retainer and closure for a garbage can liner bag. 4,189,808, Cl. 24-30.50R.
Brubaker, James E., to Sheller-Globe Corporation. Remote control mirror. 4,189,956, Cl. 74-501.00M.
Brucken, Byron L.: *See—*
Bennett, George T.; and Brucken, Byron L., 4,190,141, Cl. 192-84.00C.
Bruenig, Matthias M.; and Stolle, Herbert D. Net headrest. 4,190,289, Cl. 297-391.000.
Bruening, Inai M. R. deA.: *See—*
Bruening, Wilhelm; and Bruening, Inai M. R. deA., 4,190,425, Cl. 55-67.000.
Bruening, Wilhelm; and Bruening, Inai M. R. deA., to Petroleo Brasileiro S.A.-Petrobas. Process for the preparation of silicious polymeric materials and their applications in the separation of fluids in gaseous phase. 4,190,425, Cl. 55-67.000.
Bruning, John H., to Bell Telephone Laboratories, Incorporated. Method and apparatus for continuously patterning a photosensitive tape. 4,190,352, Cl. 355-19.000.
Brunisholz, Jean; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Monoacetals or aromatic 1,2-diketones. 4,190,602, Cl. 260-590.00D.
Brunswick Corporation: *See—*
Fitzner, Arthur O., 4,190,798, Cl. 324-169.000.
Buckeye Molding Company: *See—*
Allen, David O.; and Wombold, Harry A. E., 4,190,175, Cl. 220-270.000.
Buckley, Charles G.; and Kiedrowski, James A., to Sperry Corporation. Permanent magnet torquer for free rotor flexure suspended gyroscopes. 4,189,948, Cl. 74-5.460.
Buckley, Paul K.: *See—*
Cawley, Richard E.; and Buckley, Paul K., 4,190,199, Cl. 126-419.000.
Buescher, Eugene J., to O'Meara, William R. Stationery having snap-open envelope with remailable portion. 4,190,162, Cl. 206-625.000.
Bulova Watch Company, Inc.: *See—*
Sauter, Charles A., 4,189,951, Cl. 74-440.000.
Bunker Ramo Corporation: *See—*
Makuch, John A., 4,190,317, Cl. 350-96.200.
Buras, Edmund M., Jr.: *See—*
Harper, Allan C.; and Buras, Edmund M., Jr., 4,189,832, Cl. 30-34.200.
Burckhardt, Urs; and Troxler, Richard J., to Ciba-Geigy Corporation. Process for producing desoxy-α-acids. 4,190,604, Cl. 260-592.000.
Burd, Lamar: *See—*
Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, 4,190,450, Cl. 106-38.900.
Burgyan, Lajos, to Femal, Michael J., a part interest. Motor vehicle audio information system. 4,190,819, Cl. 340-23.000.
Burk, George A.; and Wilson, Charles A., to Dow Chemical Company, The. Stabilized aqueous amide antimicrobial composition. 4,190,668, Cl. 424-304.000.
Burnside, Walter M., to Bally Manufacturing Corporation. Coin and paper money payout system. 4,190,066, Cl. 133-4.00R.
Burr Oak Tool & Gauge Company: *See—*
Stroup, Steven L.; and Harman, Galen B., 4,190,407, Cl. 425-110.000.
Burroughs Corporation: *See—*
Gajski, Daniel D., 4,190,893, Cl. 364-746.000.
Woodward, Thomas R., 4,190,821, Cl. 340-147.0SC.
Burroughs Wellcome Co.: *See—*
Almeida, June D., 4,190,645, Cl. 424-89.000.
Grivsky, Eugene M., 4,190,674, Cl. 424-324.000.
Butler, John P.; and Hammerli, Martin, to Atomic Energy of Canada Limited. Apparatus for removal and recovery of tritium from light and heavy water. 4,190,515, Cl. 204-266.000.
Butler, L. Dennis, to Sperry Rand Corporation. Stack side evener. 4,190,392, Cl. 414-39.000.
Buynak, William J., to U.S. Philips Corporation. Editing display system with dual cursors. 4,190,835, Cl. 340-750.000.
Buzzell, Harold O., to Polaroid Corporation. Apparatus and method for preparing gradient dyed sheet. 4,190,418, Cl. 8-4.000.
Byerly, Robert M., to Viking Industries, Inc. Clamp. 4,189,807, Cl. 24-16.00R.
C Rob Hammerstein GmbH: *See—*
Bauer, Heinz; Becker, Burckhard; and Gedig, Alfred, 4,190,225, Cl. 248-394.000.
Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, 4,189,957, Cl. 74-535.000.
Cachia, Joseph M., to Allied Chemical Corporation. Comfort mechanism for seat belt retractor. 4,190,212, Cl. 242-107.000.
Cachia, Joseph M., to Allied Chemical Corporation. Passive seat belt system. 4,190,266, Cl. 280-802.000.
California Medical Developments, Inc.: *See—*
Olsen, C. Eric, 4,190,153, Cl. 206-362.000.
Calvert, Edward G., to Masson Scott Thrissell Engineering, Ltd. Slitter rollers. 4,189,967, Cl. 83-665.000.
Cameron, Albert R.; and Gneiding, Donald R., to Singer Company, The. Damping valve for pressure regulator. 4,190,076, Cl. 137-505.450.
Cameron Iron Works, Inc.: *See—*
Fisher, Edmund A.; and Czereweaty, Frank P., 4,190,114, Cl. 166-346.000.
Vanderford, Delbert E., 4,190,270, Cl. 285-142.000.
Cammack, Michael A.: *See—*
Fienhold, Stephen C.; and Cammack, Michael A., 4,190,207, Cl. 239-381.000.
Campbell, Christopher J.: *See—*
Iten, Clemens A.; and Campbell, Christopher J., 4,189,829, Cl. 30-151.000.
Campbell, Douglas D., to Minnesota Mining and Manufacturing Company. Soap-filled pad. 4,190,550, Cl. 252-93.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Hart, John A.; and Collyer, John C., 4,190,685, Cl. 427-302.000.
Hart, John A.; and Fuoco, Rolland P., 4,190,696, Cl. 428-306.000.
Moss, Gerald E.; and Stevens, Everett E., 4,190,816, Cl. 333-131.000.
Canadian General Electric Company Limited: *See—*
Whiteley, Eric, 4,190,780, Cl. 310-59.000.
Canadian Patents and Development Limited: *See—*
Alcock, A. John; Corkum, Paul B.; and James, Douglas J., 4,190,811, Cl. 331-94.50M.
Candor, James T. Method and apparatus for electrostatically forming a layer of material from a slurry thereof. 4,189,845, Cl. 34-1.000.
Canni Ferrari, Mario: *See—*
Righi, Nardino; and Canni Ferrari, Mario, 4,189,949, Cl. 74-10.330.
Canon Kabushiki Kaisha: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.
Nozaki, Mineo; and Seki, Mitsuaki, 4,189,997, Cl. 101-93.090.
Okuno, Youichi; Yokota, Hideo; and Matsuda, Mutsuhide, 4,190,338, Cl. 354-106.000.
Takahashi, Teruomi; and Matsuo, Takehiko, 4,190,445, Cl. 430-66.000.
Carini, George F., to Clay Harden Company, The. Continuous casting mold flux powers. 4,190,444, Cl. 75-257.000.
Carl Hurth Maschinen-und Zahnradfabrik: *See—*
Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, 4,190,387, Cl. 409-33.000.
Carl Stahl GmbH & Co. KG: *See—*
Korger, Heinz, 4,190,288, Cl. 297-488.000.
Carl Stahl GmbH & Co. KG, Gurt -und Bandweberei: *See—*
Korger, Heinz K., 4,190,291, Cl. 297-408.000.
Carl Still, Firma: *See—*
Teschner, Wolfgang; and Bierbaum, Dieter, 4,190,498, Cl. 202-262.000.
Carlisle, Denis R., to Rolls-Royce Limited. Reflex air burner with airblast start. 4,189,913, Cl. 60-39.14R.
Carlson, Clifford R.; and Chiesa, Alan F., to General Motors Corporation. Mixture forming assembly for closed loop air-fuel metering system. 4,190,028, Cl. 123-119.0EC.
Carolus, David T.; and Edwards, Ralph W., to General Motors Corporation. Antenna cable drive and storage drum with stop mechanism. 4,190,842, Cl. 343-903.000.
Carter-Wallace, Inc.: *See—*
Stiefel, Frank J., 4,190,607, Cl. 260-601.00R.
Cassar, Richard D., to Suntech, Inc. Sulfur plasticization with olefins. 4,190,460, Cl. 106-287.320.

Cassella Aktiengesellschaft: *See*—
Tappe, Horst, 4,190,723, Cl. 542-422.000.

Casuga, Dennis W.; and Hauser, William C., to Lockhart Industries, Inc. Oil cooler bypass valve actuating means. 4,190,198, Cl. 236-34.500.

Caterpillar Tractor Co.: *See*—
Dezelan, Joseph E., 4,189,920, Cl. 60-420.000.

Cawley, Richard E.; and Buckley, Paul K., to Lennox Industries Inc. Combination heating system including a conventional furnace, heat pump and solar energy subsystem. 4,190,199, Cl. 126-419.000.

CEAG Ceagfilter und Entstaubungstechnik GmbH: *See*—
Winter, Karl, 4,190,423, Cl. 55-20.000.

Cecala, Gregory. Sport bench. 4,190,001, Cl. 108-161.000.

Celanese Corporation: *See*—
Blay, George A., 4,190,606, Cl. 260-601.00R.
Vanderspurt, Thomas H.; and Taylor, Paul D., 4,190,620, Cl. 261-148.000.

Cerny, Adrian F. Ice top meat cutting apparatus. 4,189,928, Cl. 62-66.000.

Chadwick, William H., Jr., to Sherman & Reilly, Inc. Conductor transfer device. 4,189,828, Cl. 29-762.000.

Chaffin, Charles M., to Eastman Kodak Company. Electrochemical process for the removal of contaminants from aqueous medium. 4,190,509, Cl. 204-152.000.

Chalansonnet, M. Roger, to Societe Nouvelle de Roulements. Composite bearing race and method for its fabrication. 4,189,816, Cl. 29-148.40C.

Chan, Vincent. Positioning control system. 4,190,792, Cl. 318-663.000.

Chandler, Steven G. Ballast for pick-up trucks and the like. 4,190,281, Cl. 296-37.600.

Charlot, Jean-Claude: *See*—
Salvaudon, Laurence; and Charlot, Jean-Claude, 4,190,837, Cl. 343-16.00M.

Chatham, Mark S. Phonograph cover holder (cover-up). 4,190,157, Cl. 206-477.000.

Chatlien, Emilie M. Method of teaching reading. 4,189,852, Cl. 35-8.00A.

Checki, Angelo, Jr., to RCA Corporation. Semiconductor device package. 4,190,735, Cl. 174-52.0FP.

Chemap A.G.: *See*—
Schnellmann, Ferdinand; and Meier, Hanspeter, 4,190,544, Cl. 210-461.000.

Chemcut Corporation: *See*—
Goffredo, Daniel L., 4,190,481, Cl. 156-345.000.

Chemed Corporation: *See*—
Hwa, Chih M., 4,190,421, Cl. 44-4.000.

Chemetron Corporation: *See*—
Schmerling, Donald W.; and Giacobbe, Frederick, 4,190,636, Cl. 423-415.00A.

Chemische Fabrik Kalk GmbH: *See*—
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.

Chemische Werke Huls AG: *See*—
Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, 4,190,731, Cl. 568-914.000.

Chen, Carl, to Du Pont de Nemours, E. I., and Company. Pump seal flush. 4,190,538, Cl. 210-167.000.

Chen, Chiou-Tse: *See*—
Klein, Albert J.; Chen, Chiou-Tse; and Kohl, Lou, 4,190,440, Cl. 75-211.000.

Chen, Sow-mei L.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.

Cherian, Gabriel B.: *See*—
Bright, Edward J.; Cherian, Gabriel B.; and Scheingold, William S., 4,190,310, Cl. 339-45.00R.

Cherkofsky, Saul C.; and Sharpe, Thomas R., to Du Pont de Nemours, E. I., and Company. Anti-inflammatory 4,5-diarly-2-(substituted-thio)imidazoles and their corresponding sulfoxides and sulfones. 4,190,666, Cl. 424-274.000.

Cherne Industries, Inc.: *See*—
Cherne, Lloyd G., 4,190,619, Cl. 261-92.000.

Cherne, Lloyd G., to Cherne Industries, Inc. Liquid aerating rotor assembly. 4,190,619, Cl. 261-92.000.

Chernenko, Nikolai P.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Chernyak, Petr F.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Chernyshev, Boris A.: *See*—
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.

Chester, Jerry D. Carburation system. 4,190,030, Cl. 123-119.00R.

Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., to Hughes Aircraft Company. System for reducing the effects of power supply switching. 4,190,882, Cl. 363-26.000.

Chevron Research Company: *See*—
Miller, Stephen J.; and Hughes, Thomas R., 4,190,519, Cl. 208-79.000.

Chiesa, Alan F.: *See*—
Carlson, Clifford R.; and Chiesa, Alan F., 4,190,028, Cl. 123-119.0EC.

Chikama, Toshio, to Machida Endoscope Co., Ltd. Cleaning device for wire guide tube in an endoscope. 4,190,041, Cl. 128-4.000.

Childress, Clarence T.: *See*—
Gallant, James J.; and Childress, Clarence T., 4,189,887, Cl. 52-311.000.

Childress, Ray. Protective canopy and temporary roof support for mining machinery. 4,190,385, Cl. 405-288.000.

Chirico, Cataldo C. Method and arrangement for winding capacitors. 4,190,210, Cl. 242-56.100.

Chou, Ta-Sen, to Eli Lilly and Company. Process for 3-exomethylenecepham sulfoxides. 4,190,724, Cl. 544-16.000.

Christopher, Kenneth R.: *See*—
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.

Chulay, Steven J., to Beckman Instruments, Inc. Hanger design for a swinging centrifuge rotor. 4,190,195, Cl. 233-26.000.

Chung, Jackson, to Reliance Electric Company. Multiple speed gear reducer. 4,189,962, Cl. 74-802.000.

Ciba-Geigy Corporation: *See*—
Brunisholz, Jean; and Kirchmayr, Rudolf, 4,190,602, Cl. 260-590.00D.
Burckhardt, Urs; and Troxler, Richard J., 4,190,604, Cl. 260-592.000.
Falk, Robert A., 4,190.531, Cl. 210-62.000.
Hamilton, Alexander; and Nelson, Colin, 4,190,578, Cl. 260-150.000.
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,190,433, Cl. 71-100.000.

Cietek, Timothy J.: *See*—
Traver, Frank J.; and Cietek, Timothy J., 4,190,688, Cl. 427-391.000.

Citizen Watch Co., Ltd.: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,190,892, Cl. 364-711.000.

Citta, Richard W., to Zenith Radio Corporation. Video carrier recognition system. 4,190,862, Cl. 358-195.000.

City of Hope National Medical Center: *See*—
Tiep, Brian L., 4,190,876, Cl. 361-278.000.

Clark, James A., to Bausch & Lomb Incorporated. Sterile package. 4,190,154, Cl. 206-438.000.

Clay Harden Company, The: *See*—
Carini, George F., 4,190,444, Cl. 75-257.000.

Claycomb, Jack R. Choke for controlling the flow of drilling mud. 4,190,073, Cl. 137-238.000.

Clements, Lloyd W. Irrigation pipe gate valve. 4,190,232, Cl. 251-145.000.

Clifford, Lawrence E.: *See*—
Ariotti, Robert C.; Stahl, Harold M.; and Clifford, Lawrence E., 4,190,018, Cl. 118-690.000.
Macaluso, Paul J.; and Clifford, Lawrence E., 4,190,351, Cl. 355-15.000.

Cluett, Peabody & Co., Inc.: *See*—
Lawrence, Jackson; and Webb, Harry A., 4,189,847, Cl. 34-19.000.

Coal Industry (patents) Limited: *See*—
Boast, Gordon E., 4,190,295, Cl. 299-43.000.

Cobe Laboratories, Inc.: *See*—
Herman, Stephen J.; and Giurtino, Joel F., 4,190,087, Cl. 138-96.00R.

Coberly & Associates: *See*—
Schultheis, Stephen M., 4,190,795, Cl. 323-17.000.

Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., to General Foods Corporation. Meaty textured pet food. 4,190,679, Cl. 426-623.000.

Cohen, Sheppard: *See*—
Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., 4,190,790, Cl. 315-313.000.

Coil, Michael K.; and Sylvester, Robert A., to Eastman Kodak Company. Cover sheets for integral imaging receiver elements. 4,190,447, Cl. 430-214.000.

Cointot, Denis F., to Societe Anonyme de Telecommunications. Method and device for receiving an interface signal. 4,190,741, Cl. 179-15.0BS.

Cole, James K.: *See*—
Andersen, John A.; and Cole, James K., 4,190,160, Cl. 206-591.000.

Cole, Paul M., to Du Pont de Nemours, E. I., and Company. Method for producing non-woven webs of cross-laid strands. 4,189,811, Cl. 28-100.000.

Coleman, Cecil L. Multiple wire fence tightener. 4,190,234, Cl. 254-83.000.

Coles, Ernest F., to Hawker Siddeley Dynamics Engineering, Ltd. Electro-hydraulic systems. 4,190,081, Cl. 137-624.270.

Collins, Edward H., to Mt. Pitt Company, The. Pipe chock stick. 4,190,165, Cl. 211-60.00R.

Collins, Marcus H.; and Patel, Kiritkumar R., to Eaton Corporation. Coupling apparatus. 4,190,136, Cl. 188-367.000.

Collyer, John C.: *See—*
Hart, John A.; and Collyer, John C., 4,190,685, Cl. 427-302.000.
Colognori, Aldo, to Zuppichin, Sebastian; and Colognori, Aldo. Screw, screwdriver and screw-holding attachment therefor. 4,190,091, Cl. 145-52.000.
Colonics Diversified, Inc.: *See—*
Holt, Gregory G., 4,190,059, Cl. 128-750.000.
Colten, Jerrold L., to Bristol Products Inc. Heat loss control system for building heat sumps. 4,190,761, Cl. 219-213.000.
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., to General Foods Corporation. Plant treating composition. 4,190,428, Cl. 71-29.000.
Combustion Engineering, Inc.: *See—*
Creek, Ronald B.; and Cook, John P., 4,190,857, Cl. 358-100.000.
COMCO - Dravo Corporation: *See—*
Cookson, Donald H.; and McCoy, Clifford W., 4,190,005, Cl. 110-347.000.
Commissariat a l'Energie Atomique: *See—*
Despois, Jacques; and Nougarede, Francis, 4,190,099, Cl. 165-45.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Hodgkin, Jonathan H., 4,190,709, Cl. 521-39.000.
Compagnie Generale d'Electricite: *See—*
Jacob, Louis, 4,190,812, Cl. 331-94.50P.
Compak Systems, Inc.: *See—*
Volkert, John K.; and Volkert, Robert B., 4,189,895, Cl. 53-429.000.
Compensating Tension Controls, Inc.: *See—*
Ryan, Ralph L.; and Taitel, Charles M., 4,190,483, Cl. 156-504.000.
Computer Microfilm International Corporation: *See—*
Smith, Dwight H.; and Smith, David L., 4,190,899, Cl. 364-900.000.
Conti, Angelo J.; and Pile, Ira. Toilet flush valve. 4,189,795, Cl. 4-324.000.
Conti, Armond E.: *See—*
Day, Robert A.; and Conti, Armond E., 4,189,944, Cl. 73-623.000.
Conwed Corporation: *See—*
Larsen, Ronald L., 4,190,692, Cl. 428-107.000.
Cook, John P.: *See—*
Creek, Ronald B.; and Cook, John P., 4,190,857, Cl. 358-100.000.
Cook, Mary J.; and Hyche, Kenneth W., to Eastman Kodak Company. Filled hot-melt adhesives containing modified polyethylene. 4,190,565, Cl. 260-27.00R.
Cookson, Donald H.; and McCoy, Clifford W., to COMCO - Dravo Corporation; and Electric Fuels Corporation. Process for pulverizing coal using combination gas in fluid energy pulverizers. 4,190,005, Cl. 110-347.000.
Cookson, Leonard T. Rug hooking rack. 4,189,856, Cl. 38-102.400.
Cooper, George H. Tomato harvester attachment. 4,189,906, Cl. 56-327.00R.
Cooper, Larry P.: *See—*
Marek, Cecil J.; and Cooper, Larry P., 4,189,914, Cl. 60-726.000.
Cooper, Leon M.; and Wipke, Walter J., to International Business Machines Corporation. Electric field orientation for ink jet printers for vertical and horizontal printing. 4,190,845, Cl. 346-75.000.
Copal Company Limited: *See—*
Ishiguro, Yasuo; and Wakazono, Kenji, 4,190,344, Cl. 354-234.000.
Coquelet, Claude: *See—*
Dong, P. Le Hao; and Coquelet, Claude, 4,190,661, Cl. 424-258.000.
Corinth Co. Inc.: *See—*
Frantello, Alfred A., 4,189,905, Cl. 56-295.000.
Corkum, Paul B.: *See—*
Alcock, A. John; Corkum, Paul B.; and James, Douglas J., 4,190,811, Cl. 331-94.50M.
Corning Glass Works: *See—*
Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., 4,190,451, Cl. 106-47.00Q.
Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., 4,190,535, Cl. 210-83.000.
Cornwell, Alexander M., Jr.; and Miller, Joseph N., to Jackes-Evans Manufacturing Company. Theft preventing outdoor mailbox. 4,190,192, Cl. 232-17.000.
Corru-Seals Inc.: *See—*
Nicholson, Terence P., 4,189,819, Cl. 29-417.000.
Corsmeier, Robert J.; and Rauf, James P., to General Electric Company. Gas turbine engine and means for cooling same. 4,190,398, Cl. 415-114.000.
Cousens, Michael, Jr. Bike kite. 4,190,218, Cl. 244-155.00R.
Couture, Paul A.: *See—*
Jentoft, Arthur P.; Anghinetti, Joseph P.; and Couture, Paul A., 4,189,877, Cl. 52-58.000.
Couture, Richard B. For releasably coupling agricultural attachment to shank. 4,190,115, Cl. 172-753.000.
Covic, John: *See—*
Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John, 4,190,773, Cl. 250-445.00T.
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., to Eastman Kodak Company. Container for dispensing articles to an automated analyzer. 4,190,420, Cl. 422-63.000.
Cowett, Philip M., Jr., to United States of America, Army. Switching-regulated DC-to-DC converter. 4,190,883, Cl. 363-26.000.
Cramer, Marietta: *See—*
Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, 4,189,942, Cl. 73-356.000.
Crane, Hewitt D.; and Wolf, Daniel E., to Stanford Research Institute International. Signal train verification system using landmarks. 4,190,820, Cl. 340-146.3SG.
Crawford, Allan H., to Mohasco Corporation. Ottoman protecting device. 4,190,282, Cl. 297-68.000.
Creek, Ronald B.; and Cook, John P., to Combustion Engineering, Inc. Periscope assembly. 4,190,857, Cl. 358-100.000.
Crimmins, William M.: *See—*
Marinkovich, Cedomir S.; and Crimmins, William M., 4,190,774, Cl. 250-446.000.
Critchfield, Frank E.: *See—*
Zdrahala, Richard J.; and Critchfield, Frank E., 4,190,711, Cl. 521-112.000.
Crompton & Knowles Corporation: *See—*
Cyvas, Petras, 4,190,089, Cl. 139-437.000.
Cross, Edward F.; and Garber, Wilbur A., to United States of America, Air Force. Method for improved performance of infrared vidicon cameras. 4,190,858, Cl. 358-113.000.
Crossman, Philip E.; and Van Ryn, Arthur L., to American Seating Company. Beam-mounted folding chairs. 4,189,876, Cl. 52-9.000.
Crouse, Ronald J., to TRW Inc. Optical encoder apparatus. 4,190,767, Cl. 250-231.0SE.
Cunningham, Bruce B.; and Barfield, Charles R., Jr., to Lanman Lithotech, Inc. Vacuum contact reproduction apparatus. 4,190,360, Cl. 355-89.000.
Curran, John R., to Foxboro Company, The. Industrial process recorder incorporating improved roll chart assembly. 4,190,848, Cl. 346-145.000.
Curtis & Marble Machine Company: *See—*
Laing, Robert, 4,189,894, Cl. 53-399.000.
Curtiss, Roy, III, to Research Corporation. Modified microorganisms and method of preparing and using same. 4,190,495, Cl. 435-172.000.
Custom Concepts Incorporated: *See—*
Kubiatowicz, James F., 4,189,911, Cl. 58-106.000.
Cyvas, Petras, to Crompton & Knowles Corporation. Projectile launching apparatus. 4,190,089, Cl. 139-437.000.
Czerewaty, Frank P.: *See—*
Fisher, Edmund A.; and Czerewaty, Frank P., 4,190,114, Cl. 166-346.000.
Daiichi Radioisotope Laboratories, Ltd.: *See—*
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.
Dainichi-Nippon Cables, Ltd.: *See—*
Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, 4,190,137, Cl. 191-27.000.
Damme, Heinz: *See—*
Schoop, Josef; Resch, Werner; and Damme, Heinz, 4,190,238, Cl. 266-270.000.
Dana Corporation: *See—*
Fielder, David F., 4,189,932, Cl. 72-370.000.
Danek Industries, Inc.: *See—*
Haynes, John A., 4,189,854, Cl. 37-117.500.
Danfoss A/S: *See—*
Tankred, Hans J.; and Kristensen, Erling B., 4,189,984, Cl. 92-82.000.
Dankowski, Gerhard. Heat exchange tube. 4,190,105, Cl. 165-179.000.
Danmura, Tugiaki: *See—*
Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, 4,190,877, Cl. 361-298.000.
Dardoufas, Kimon C.: *See—*
Marshall, Robert M.; and Dardoufas, Kimon C., 4,190,545, Cl. 252-8.750.
Dassen, Bernardus H. N., to Stamicarbon, B.V. Process for biological purification of waste water. 4,190,528, Cl. 210-8.000.
Davies, John E.; and Galli, Guido, to International Business Machines Corporation. Method for forming a liquid phase epitaxial film on a wafer. 4,190,683, Cl. 427-130.000.
Davis, Carl A. Well cementing/plug drilling apparatus and improved cementing and drilling process. 4,190,111, Cl. 166-291.000.
Davis, Carl A. Pump down wipe plug and cementing/drilling process. 4,190,112, Cl. 166-291.000.
Davis, Noel: *See—*
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.
Davis, Robert. Variable chamber diesel engine. 4,190,024, Cl. 123-48.00A.
Davis, Thomas J., to Electric Power Research Institute, Inc. Method and apparatus for rotating cartesian coordinate signals. 4,190,895, Cl. 364-815.000.
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A. Method of obtaining refrigeration at cryogenic level. 4,189,930, Cl. 62-502.000.
Dawidowitsch, Peter: *See—*
Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, 4,189,803, Cl. 15-302.000.
Day, Robert A.; and Conti, Armond E., to United States of America, Energy. Hydrodynamic ultrasonic probe. 4,189,944, Cl. 73-623.000.
Dayco Corporation: *See—*
Bond, Jerome S., 4,190,214, Cl. 242-138.000.
Miranti, Joseph P., Jr., 4,189,968, Cl. 83-816.000.
Dean, Robert H.; and Dyer, Oliver Q., to International Telephone and Telegraph Corporation. Backflow prevention devices. 4,190,071, Cl. 137-115.000.
De Boel, Marcel; and Baudin, Pol, to BFG Glassgroup. Light-transmitting fire screening panel. 4,190,698, Cl. 428-334.000.
de Bruin, Frank. Apparatus for jointly examining and depositing a plurality of transparent pictures. 4,189,858, Cl. 40-158.00B.

deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., to Deere & Company. Adjustable shear bar for a harvester cutterhead. 4,190,209, Cl. 241-101.700.
Decker, Cloyd E., to Robertshaw Controls Company. Control system and method and control device therefor. 4,190,764, Cl. 219-506.000.
Decker, Llewellyn: *See*—
Santiago, Romeo S.; and Decker, Llewellyn, 4,190,762, Cl. 219-245.000.
Decker, Quintin W.; and Marcus, Erich, to Union Carbide Corporation. Production of tertiary amines by reductive alkylation. 4,190,601, Cl. 260-583.00R.
Dee-Jay Independent Services Group, Inc.: *See*—
Dressler, John A., Jr., 4,190,734, Cl. 174-38.000.
Deere & Company: *See*—
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.
Flenniken, John M., 4,189,875, Cl. 51-250.000.
Klope, Lawrence R., 4,190,298, Cl. 303-2.000.
Stecklein, Gary L., 4,190,378, Cl. 403-146.000.
DeForest, Laurence R., to Phillips Petroleum Co. Closure member for a container. 4,190,189, Cl. 229-5.600.
DeFreitas, Richard E., to DeltaLab Research, Inc. Digital encoding circuitry. 4,190,801, Cl. 325-38.00B.
De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., to Shell Oil Company. Dissolving barium sulfate scale with aqueous solutions of salts of carboxymethyl monocyclic macrocyclic polyamines. 4,190,462, Cl. 134-2.000.
Del Laboratories, Inc.: *See*—
Gordon, Harry W.; and Amanat, Sharif, 4,190,064, Cl. 132-7.000.
Delachaux, C.: *See*—
Bommart, Patrick, 4,190,228, Cl. 249-86.000.
Delaney, Bobby R.: *See*—
West, Harrison; and Delaney, Bobby R., 4,189,939, Cl. 73-116.000.
Delaplaine, Robert W.: *See*—
Greenleaf, John E.; and Delaplaine, Robert W., 4,190,060, Cl. 128-760.000.
Dell, William C. Fluidized bed ladle heating method and apparatus. 4,190,235, Cl. 266-44.000.
Delony, Timothy E.: *See*—
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.
Delta Materials Research Limited: *See*—
Robinson, William D., 4,190,131, Cl. 181-296.000.
DeltaLab Research, Inc.: *See*—
DeFreitas, Richard E., 4,190,801, Cl. 325-38.00B.
DeMarco, Joseph; and Brenner, Gerald S., to Merck & Co., Inc. Amiloride citrate. 4,190,655, Cl. 424-250.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, 4,190,454, Cl. 106-90.000.
DePuy, Robert P.; and Leitten, Arthur H., Jr., to General Electric Company. Logarithmic analog-to-digital converter. 4,190,825, Cl. 340-347.0AD.
Derroitte, Jean-Louis: *See*—
Alard, Joseph; and Derroitte, Jean-Louis, 4,190,624, Cl. 264-146.000.
Desalination Systems, Inc.: *See*—
Tondreau, Raymond A.; and Bray, Donald T., 4,190,537, Cl. 210-98.000.
Desilets, Jean-Paul. Spider thread. 4,190,132, Cl. 182-6.000.
Desmond, Timothy F.: *See*—
Anderson, George J.; Santer, J. Owen; and Desmond, Timothy F., 4,190,700, Cl. 428-524.000.
Despois, Jacques; and Nougarede, Francis, to Commissariat a l'Energie Atomique; and Societe Nationale elf Aquitaine. Heat transfer system for the utilization of cavities dug in the subsoil as heat silos. 4,190,099, Cl. 165-45.000.
Deuel, Ronald F.: *See*—
Morreall, Donald R.; and Deuel, Ronald F., 4,189,998, Cl. 101-93.310.
Deutsch Company, The: *See*—
Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., 4,190,316, Cl. 350-96.180.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Achenbach, Karl; and Turk, Gunter, 4,190,632, Cl. 423-118.000.
Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, to Western Electric Company, Incorporated. Double crucible crystal growing apparatus. 4,190,631, Cl. 422-249.000.
Dezelan, Joseph E., to Caterpillar Tractor Co. Load signal control of hydraulic motor displacement. 4,189,920, Cl. 60-420.000.
Diamond, Arthur S.: *See*—
Tapper, Robert; Diamond, Arthur S.; and Arora, Ajit S., 4,190,056, Cl. 128-630.000.
Diamond International Corporation: *See*—
Moulds, Frank G.; and McCord, Michael A., 4,189,898, Cl. 53-446.000.
Diamond, Joseph M., to McNab, Incorporated. Multichannel salinity meter. 4,190,827, Cl. 340-500.000.
Diamond, Steven E.; and Mares, Frank, to Allied Chemical Corporation. Process for dehalogenating the metal-halide bond in a low valent group VIII metal halide complex. 4,190,595, Cl. 260-429.00R.
DiBugnara, Raymond, to TRW Inc. Metal-silica solution for forming films on semiconductor surfaces. 4,190,458, Cl. 106-287.160.
Dickson, Ross P.: *See*—
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.
Dieterich, Dieter: *See*—
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.
Dieterich, Frank L.; and Abrams, Stanton, to Dieterich, Frank L. Self-centering vegetable drying apparatus. 4,189,850, Cl. 34-58.000.
Dietrich, Werner: *See*—
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.
Diggs, Jesse S.: *See*—
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.
Digital Equipment Corporation: *See*—
Mudge, J. Craig, 4,190,894, Cl. 364-758.000.
Dillon, Glenn W.; and Lindell, Albert H., to Stock Equipment Company. Method and apparatus for making closure construction. 4,189,824, Cl. 29-522.00R.
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., to Varian Associates, Inc. Tomographic scanning apparatus having detector signal digitizing means mounted to rotate with detectors. 4,190,772, Cl. 250-445.00T.
Dischert, Robert A.; and Thorpe, Laurence J., to RCA Corporation. Remote control system for a television camera. 4,190,863, Cl. 358-210.000.
Dischert, Robert A., to RCA Corporation. Remote iris control for television cameras. 4,190,864, Cl. 358-210.000.
Doane, Patrick K., to Kimball International, Inc. Electronic expression control. 4,189,973, Cl. 84-1.270.
Dr. Johannes Heidenhain GmbH: *See*—
Holstein, Siegbert, 4,189,840, Cl. 33-125.00C.
Doi, Yoshinao; Kohno, Mitsuo; and Yoshitake, Katsumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Alkaline battery separator. 4,190,707, Cl. 429-254.000.
Domino Equipment Pty. Ltd.: *See*—
Strachan, John B., 4,190,629, Cl. 422-169.000.
Domtar Inc.: *See*—
Tomlinson, George H., II, 4,190,490, Cl. 162-19.000.
Donald MacMillan & Son, Inc.: *See*—
MacMillan, Kenneth T., 4,190,405, Cl. 425-20.000.
Dong, P. Le Hao; and Coquelet, Claude, to Laboratoires Chauvin-Blache. Pyrazolo-quinolines, compositions and pharmaceutical preparations. 4,190,661, Cl. 424-258.000.
Donoghue, Robert E.: *See*—
Galloway, Dudley L.; and Donoghue, Robert E., 4,190,732, Cl. 174-17.0LF.
Donohoe, Stephen C. Wheeled patient support. 4,190,280, Cl. 296-20.000.
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank. Distributed microprocessor control system for a copier/duplicator. 4,190,350, Cl. 355-14.00R.
Doodewaard, Jean: *See*—
Marx, Arthur F.; and Doodewaard, Jean, 4,190,670, Cl. 424-305.000.
Doornink, Douglas J., to Tektronix, Inc. Circuit and method for producing a full-screen cross-hair cursor on a raster-scan type display. 4,190,834, Cl. 340-709.000.
Dorer, Gary L.; and Mikelsons, Valdis, to Minnesota Mining and Manufacturing Company. Microstructured transmission and reflectance modifying coating. 4,190,321, Cl. 350-165.000.
Dorren, Louis, to Matsushita Electric Corp. of America. Compatible four channel FM system. 4,190,737, Cl. 179-1.0GH.
Doty, John S.: *See*—
Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., 4,190,316, Cl. 350-96.180.
Dow Chemical Company, The: *See*—
Burk, George A.; and Wilson, Charles A., 4,190,668, Cl. 424-304.000.
Fenstermacher, Myk R.; and Noveroske, Robert L., 4,190,662, Cl. 424-263.000.
Flynn, James P., 4,190,471, Cl. 149-19.600.
Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., 4,190,605, Cl. 260-600.00R.
Downie, David E.: *See*—
Hill, J. Donald; Harvey, Robert J.; and Downie, David E., 4,190,057, Cl. 128-675.000.
Doyle, Walter M., to Laser Precision Corporation. Refractively scanned interferometer. 4,190,366, Cl. 356-346.000.
Draiswerke GmbH: *See*—
Durr, Herbert; and Muller, Helmut, 4,190,371, Cl. 366-139.000.
Dreier, William M.: *See*—
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.
Drennen, Thomas J.; and Gill, Robert A., to Rohm and Haas Company. Process for controlling pitch in papermaking. 4,190,491, Cl. 162-76.000.
Dresser Industries, Inc.: *See*—
O'Dell, Larry A., 4,190,296, Cl. 299-89.000.
Dressler, John A., Jr., to Dee-Jay Independent Services Group, Inc. Cable pedestal rodent guard system, method of constructing same, and kit and composition. 4,190,734, Cl. 174-38.000.
Drost, James L.; and Gordin, Myron K., to Muscatine Lighting Manufacturing Co. Crossarm assembly for high intensity discharge luminaries. 4,190,881, Cl. 362-250.000.
Droual, Rene: *See*—
Letournoux, Alain; and Droual, Rene, 4,190,226, Cl. 248-429.000.

Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., to United Technologies Corporation. Method and apparatus for removing inclusion contaminants from metals and alloys. 4,190,404, Cl. 425-8.000.
Drzewiecki, Tadeusz M.; and Goto, John M., to United States of America, Army. Fluidic logical pyrotechnic initiator. 4,190,083, Cl. 137-838.000.
Dubrunfaut, Gerard H., to Societe Anonyme de Telecommunications. Optical telemetering apparatus. 4,190,361, Cl. 356-5.000.
Dubrunfaut, Gerard H., to Societe Anonyme de Telecommunications. Laser telemeter. 4,190,362, Cl. 356-5.000.
Dundas, Gifford W. Swimming pool heating and cooling system. 4,189,791, Cl. 4-172.000.
Dunmire, Howard L.; and Horn, Stuart B., to United States of America, Army. Optimized cooler dewar. 4,190,106, Cl. 165-185.000.
Dunne, Anthony L.: *See*—
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.
Du Pont de Nemours, E. I., and Company: *See*—
Adam, Alain C., 4,190,156, Cl. 206-447.000.
Agers, Brian M.; and Todd, Maurice C., 4,189,812, Cl. 28-272.000.
Booth, Charles L., 4,190,500, Cl. 204-1.00R.
Chen, Carl, 4,190,538, Cl. 210-167.000.
Cherkofsky, Saul C.; and Sharpe, Thomas R., 4,190,666, Cl. 424-274.000.
Cole, Paul M., 4,189,811, Cl. 28-100.000.
Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., 4,190,530, Cl. 210-31.00R.
Larsen, Max J., 4,190,196, Cl. 233-26.000.
Levitt, George, 4,190,432, Cl. 71-93.000.
Niederhauser, Donald O., 4,190,695, Cl. 428-234.000.
Dupont, Regis: *See*—
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.
Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, to Smith-Kline & French Laboratories Limited. Amidino and guanidino phosphonates. 4,190,664, Cl. 424-270.000.
Durbin, John A.: *See*—
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.
Durr, Herbert; and Muller, Helmut, to Draiswerke GmbH. Apparatus for discontinuous mixing of at least two materials. 4,190,371, Cl. 366-139.000.
Duvelius, Rembert: *See*—
Pohl, Andreas P. I., 4,190,484, Cl. 156-580.000.
Dyer, Oliver Q.: *See*—
Dean, Robert H.; and Dyer, Oliver Q., 4,190,071, Cl. 137-115.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.
Dynapol: *See*—
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,190,716, Cl. 525-334.000.
Eakins, Kenneth E.; and Bhattacherjee, Parimal, to Nelson Research & Development Company. Colchicine ophthalmic composition and method of use. 4,190,673, Cl. 424-324.000.
Eastman Kodak Company: *See*—
Chaffin, Charles M., 4,190,509, Cl. 204-152.000.
Coil, Michael K.; and Sylvester, Robert A., 4,190,447, Cl. 430-214.000.
Cook, Mary J.; and Hyche, Kenneth W., 4,190,565, Cl. 260-27.00R.
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,190,420, Cl. 422-63.000.
Fassler, Werner, 4,190,342, Cl. 354-202.000.
Frank, Lee F.; and Lee, James K., 4,190,336, Cl. 354-50.000.
Martin, Thomas W.; Sandhu, Mohammad A.; and Savage, Dennis J., 4,190,446, Cl. 430-25.000.
Smith, Frank T. J., 4,189,826, Cl. 29-590.000.
Eaton Corporation: *See*—
Arnaud, Gerard, 4,190,181, Cl. 222-456.000.
Collins, Marcus H.; and Patel, Kiritkumar R., 4,190,136, Cl. 188-367.000.
Goscenski, Edward J., Jr., 4,189,919, Cl. 60-420.000.
Knapp, Kenneth K., 4,189,921, Cl. 60-445.000.
Konkle, Phillip E.; and Tinholt, Thomas H., 4,190,140, Cl. 192-82.00T.
Piber, Earl T., 4,190,750, Cl. 200-67.0AA.
Tinholt, Thomas H.; and Konkle, Phillip E., 4,190,139, Cl. 192-58.00B.
Eaton, Thomas J., Jr.: *See*—
Gray, James W., 4,189,964, Cl. 81-3.00R.
Eberhart, James G.; and Battles, James E., to United States of America, Energy. Treatment of electrochemical cell components with lithium tetrachloroaluminate ($LiAlCl_4$) to promote electrolyte wetting. 4,189,827, Cl. 29-623.100.
Ebert, Edward A. Bait carrier and driver. 4,189,860, Cl. 43-42.290.
Ebert, Edward A. Support for deformable articles and method of making the same. 4,190,480, Cl. 156-296.000.
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Co., Ltd. Zero suppressing system for electronic device. 4,190,892, Cl. 364-711.000.
Eckart, Manfred, to Vorwerk Interholding GmbH. Adapter. 4,190,307, Cl. 339-6.00R.
Eckert, Lewis W.; and Stewart, Olivia D., to Armstrong Cork Company. Method of producing acoustical fiberboard. 4,190,492, Cl. 162-145.000.
Ecodyne Corporation: *See*—
Halbfoster, Christopher J., 4,190,532, Cl. 210-75.000.
Edgar Pickering (Blackburn) Limited: *See*—
Mellor, Leslie, 4,190,006, Cl. 112-79.00R.
Edwards, Ralph W.: *See*—
Carolus, David T.; and Edwards, Ralph W., 4,190,842, Cl. 343-903.000.
Eggleston, Frederick C., to Essex Group, Inc. Fiber optic ribbon and cable made therefrom. 4,190,319, Cl. 350-96.230.
Eidelman, Lev G.: *See*—
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., 4,190,630, Cl. 422-249.000.
Electric Fuels Corporation: *See*—
Cookson, Donald H.; and McCoy, Clifford W., 4,190,005, Cl. 110-347.000.
Electric Power Research Institute, Inc.: *See*—
Davis, Thomas J., 4,190,895, Cl. 364-815.000.
Elfgen, Reiner: *See*—
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.
Eli Lilly and Company: *See*—
Chou, Ta-Sen, 4,190,724, Cl. 544-16.000.
Lacefield, William B., 4,190,725, Cl. 544-182.000.
Ellerstein, Stuart M., to Thiokol Corporation. Thermoplastic elastic polysulfide polymers. 4,190,625, Cl. 264-176.00R.
Ellis, David M. Pressure generator. 4,189,936, Cl. 73-4.00R.
Ellis, Juanita W. Table for use in religious services. 4,190,303, Cl. 312-33.000.
Elmy, Richard A., to W. M. Cissell Manufacturing Company. Fail-safe gas feed and ignition sequence control apparatus and method for a gas-fired appliance. 4,190,414, Cl. 432-46.000.
Emmerich, Kenneth C.; and Hamlin, Ralston L., to Fansteel Inc. Drill bit and steel combination for improved fluid flow. 4,190,125, Cl. 175-410.000.
Emmerich, Kenneth C., to Fansteel Inc. Roof drill bit with hexagonal body portion. 4,190,128, Cl. 175-410.000.
Empresa Nacional de Ingenieria y Tecnologia, S.A.: *See*—
Hernandez Crespo, Mariano, 4,190,082, Cl. 137-625.170.
England, Robert C. Device for insertion, manipulation and removal of soft contact lenses. 4,190,277, Cl. 294-1.0CA.
English Clays Lovering Pochin & Co., Ltd.: *See*—
Watson, James H. P., 4,190,524, Cl. 209-213.000.
Engnell, David: *See*—
Rottler, Donald B.; Engnell, David; and Rottler, Donald B., 4,189,871, Cl. 51-34.00J.
Enrico Corvi Mora: *See*—
Vegezzi, Davide, 4,190,675, Cl. 424-331.000.
Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H.: *See*—
Tuson, Samuel, 4,190,090, Cl. 141-387.000.
Erdman, Victor. Pick up tine. 4,189,907, Cl. 56-400.000.
Erickson Air Crane Co.: *See*—
Smith, Harlan B., 4,189,892, Cl. 52-749.000.
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., to Becton, Dickinson Electronics Company. Rotary thumbwheel switch assembly. 4,190,749, Cl. 200-11.0TW.
Esaki, Koreaki, to West Electric Company, Ltd. Photographic flash device. 4,190,880, Cl. 362-18.000.
Essex Group, Inc.: *See*—
Bell, Robert E., 4,190,830, Cl. 340-642.000.
Eggleston, Frederick C., 4,190,319, Cl. 350-96.230.
Essex Transducers Corporation: *See*—
Kompanek, Harry W., 4,190,785, Cl. 310-330.000.
Etess, Edward, to Monitor Labs, Inc. Sulfur monitor analyzer. 4,190,368, Cl. 356-417.000.
Ethicon, Inc.: *See*—
Shalaby, Shalaby W., 4,190,720, Cl. 528-354.000.
Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, to Kyowa Hakko Kogyo Kabushiki Kaisha. Cyclic phosphoric acid amide esters, and an insecticide containing the same as active ingredient. 4,190,651, Cl. 424-209.000.
Etoh, Kunihiko; Owa, Kaoru; and Nakashima, Kunimichi, to Toyoda-Koki Kabushiki-Kaisha. Automatic centering controller for a machine tool. 4,190,889, Cl. 364-474.000.
Eutectic Corporation: *See*—
Patel, Mahesh S., 4,190,442, Cl. 75-252.000.
Patel, Mahesh S., 4,190,443, Cl. 75-252.000.
Evans, F. David, to Kimwood Corporation. Abrading apparatus and method having induced air. 4,189,872, Cl. 51-135.00R.
Evans, James L.; and Main, John A., to Kelsey-Hayes Co. Wheel rim. 4,190,092, Cl. 152-381.100.
Evers, Edwin W.: *See*—
Body, Richard H.; and Evers, Edwin W., 4,190,332, Cl. 351-13.000.
EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH.: *See*—
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.
Exxon Research & Engineering Co.: *See*—
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,190,706, Cl. 429-191.000.
Facit Aktiebolag: *See*—
Stenudd, Sven G. V., 4,190,847, Cl. 346-141.000.
Fahn, Stanley. Method and compositions of treating Parkinsonisms with levodopa and 3',4'-dihydroxy-2-methylisopropiophenone. 4,190,672, Cl. 424-319.000.

Fahnestock, Melvin R.: *See—*
Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., 4,190,186, Cl. 228-15.100.

Fainzilberg, Leonid S.: *See—*
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,190,888, Cl. 364-497.000.

Fair, James W.: *See—*
Young, Danny J., 4,190,766, Cl. 250-203.00R.

Fajen, Lyle A., to United States of America, Air Force. Amplifier-oscillator frequency multiplier apparatus. 4,190,808, Cl. 331-59.000.

Falk, Robert A., to Ciba-Geigy Corporation. Method of concentrating and collecting oil spills. 4,190,531, Cl. 210-62.000.

Fangman, John S.: *See—*
Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, 4,190,631, Cl. 422-249.000.

Fansteel Inc.: *See—*
Emmerich, Kenneth C.; and Hamlin, Ralston L., 4,190,125, Cl. 175-410.000.
Emmerich, Kenneth C., 4,190,128, Cl. 175-410.000.

Farcilli, Andre: *See—*
Warnant, Julien; Farcilli, Andre; and Medici, Italo, 4,190,658, Cl. 424-256.000.

Fargo Manufacturing Company, Inc.: *See—*
Becker, Stephen P., 4,189,976, Cl. 85-9.00R.

Farnsworth, David L.; and Thomas, Ronald E., to Sperry Corporation. Digital processor input/output apparatus for analog, digital and discrete data. 4,190,898, Cl. 364-900.000.

Fassbender, Rolf; and Lang, Armin, to Zahnradfabrik Friedrichshafen AG. Servomotor pressure control responsive to piston travel. 4,189,983, Cl. 91-400.000.

Fassbender, Rolf: *See—*
Lang, Armin; and Fassbender, Rolf, 4,189,982, Cl. 91-400.000.

Fassler, Werner, to Eastman Kodak Company. Mechanism for controlling a timed function in a camera. 4,190,342, Cl. 354-202.000.

Fathergill, Rex D.: *See—*
Martin, James O.; Fathergill, Rex D.; and Krimm, David L., 4,189,974, Cl. 84-293.000.

Faure, Jean M. Apparatus for volume measurement of liquids. 4,189,943, Cl. 73-425.600.

Fayles, Robert R.: *See—*
Tengzelius, Jan R.; and Fayles, Robert R., 4,190,441, Cl. 75-251.000.

Feder, Joseph: *See—*
Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, 4,190,708, Cl. 435-215.000.

Feiler, William A., to Monsanto Company. Purifying phosphoric acid by extraction with an aliphatic nitrile. 4,190,634, Cl. 423-321.00S.

Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., to Bell Telephone Laboratories, Incorporated. Signal corrected optocoupled device. 4,190,747, Cl. 179-170.0NC.

Femal, Michael J.: *See—*
Burgyan, Lajos, 4,190,819, Cl. 340-23.000.

Fennimore, Jack: *See—*
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, 4,190,542, Cl. 210-282.000.

Fenstermacher, Myk R.; and Noveroske, Robert L., to Dow Chemical Company, The. Halomethyl substituted dialkoxypyridines. 4,190,662, Cl. 424-263.000.

Fernandez, Ramon J.; and Kahl, John S., to Brown & Root, Inc. Underwater storage assembly. 4,190,072, Cl. 137-236.00S.

Ferrari, Giorgio: *See—*
Gherardi, Paolo; and Ferrari, Giorgio, 4,190,654, Cl. 424-244.000.

Ferriss, Lincoln S.: *See—*
Hoffman, Jay; and Ferriss, Lincoln S., 4,189,946, Cl. 74-5.400.

Ferro, Jesus. Projection screen. 4,190,320, Cl. 350-129.000.

Festal, Didier: *See—*
Szarvasi, Etienne; and Festal, Didier, 4,190,665, Cl. 424-274.000.

Fibco Inc.: *See—*
Mileti, Robert A., 4,190,275, Cl. 293-102.000.

Fiedler, Jurgen; and Fricke, Klaus, to GEFI Gesellschaft fur Industriewarme und Verfahrenstechnik mit Beschrankter Haftung. Process for the continuous production of solids, in particular protein concentrates, from aqueous solutions, and apparatus for the practice of the process. 4,189,846, Cl. 34-8.000.

Fielder, David F., to Dana Corporation. Piston pin bore and method of finishing. 4,189,932. Cl. 72-370.000.

Fienhold, Stephen C.; and Cammack, Michael A., to Teledyne Industries, Inc. Pulsating spray apparatus. 4,190,207, Cl. 239-381.000.

Fikse, Tyman H., to Robbins Company, The. Excavator for use in a tunneling shield. 4,190,294, Cl. 299-33.000.

Fine, Dwight A.: *See—*
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., 4,190,704, Cl. 429-103.000.

Finnila, Ronald M.; and Su, Stephen C., to Hughes Aircraft Company. Monolithic extrinsic silicon infrared detectors with charge coupled device readout. 4,190,851, Cl. 357-30.000.

Fischer, Artur. Assembly kit and a connecting element for connecting structural elements thereof. 4,189,861, Cl. 46-26.000.

Fischer, Artur. Hollow structural element and an assembly kit including the same. 4,189,863, Cl. 46-116.000.

Fischer, Klaus; and Keul, Robert, to Saint-Gobain Industries. Neutral bronze glazings. 4,190,452, Cl. 106-52.000.

Fischer, Werner. Tennis racket and method of making same. 4,190,249, Cl. 273-73.00D.

Fisher, Edmund A.; and Czerewaty, Frank P., to Cameron Iron Works, Inc. Subsea wellhead apparatus. 4,190,114, Cl. 166-346.000.

Fitzgerald, Gerald A. House roof insulation vent. 4,189,878, Cl. 52-95.000.

Fitzner, Arthur O., to Brunswick Corporation. Tachometer driven from a capacitor discharge ignition system and including a transistorized shunt voltage regulator. 4,190,798, Cl. 324-169.000.

Flambeau Products Corporation: *See—*
Mason, LeRoy W.; and Furrer, Frederick J., 4,190,173, Cl. 220-203.000.

Flanagan, Kirby E. L., to McCord Corporation. Low density energy management urethane foam. 4,190,712, Cl. 521-137.000.

Flatau, Abraham; Olson, Donald N.; and Miller, Miles C. Process of forming a projectile by folding a resilient tubular member and filling same with payload. 4,190,476, Cl. 156-218.000.

Fleischer, Donald W., to Veeder Industries Inc. Counter operating system. 4,190,765, Cl. 235-92.00C.

Fleischer, Henry. Support frames adapted for use with car seats and beds. 4,190,285, Cl. 297-254.000.

Flenniken, John M., to Deere & Company. Harvester cutterhead knife sharpening device. 4,189,875, Cl. 51-250.000.

Fletcher, Aaron N.: *See—*
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., 4,190,704, Cl. 429-103.000.

Fletcher, Vernon R., to Riker Laboratories, Inc. Azide and isocyanate derivatives of 2-nitro-3-phenylbenzofuran. 4,190,590, Cl. 260-346.730.

Flowerday, Dale L., to Keeler Corporation. Back plate and bail assembly. 4,189,804, Cl. 16-126.000.

Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., to Aluminum Company of America. Preparation of tube for welding. 4,190,186, Cl. 228-15.100.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., to American Cyanamid Company. Various 15-deoxy-16-hydroxy-16-ethynyl and 16-ethynylsubstituted prostaglandins. 4,190,596, Cl. 260-448.20D.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., to American Cyanamid Company. Various 15-deoxy-16-hydroxy-16-ethynyl and 16-ethynylsubstituted prostaglandins. 4,190,597, Cl. 260-448.20D.

Fluid Kinetics Corporation: *See—*
Glover, Robert C., 4,190,403, Cl. 417-543.000.

Flynn, James P., to Dow Chemical Company, The. Pyrotechnic disseminating formulations. 4,190,471, Cl. 149-19.600.

FMC Corporation: *See—*
Le Devehat, Eugene R., 4,190,080, Cl. 137-615.000.

Foerstner, Richard A., to Amana Refrigeration, Inc. Digitally programmed microwave cooker. 4,190,756, Cl. 219-10.55B.

Follin, James W.; and Miller, Robert E., to United States of America, Navy. Digital beamsteering for a parametric scanning sonar system. 4,190,818, Cl. 367-138.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Sliding lid for flanged tray. 4,190,191, Cl. 229-43.000.

Ford Motor Company: *See—*
Kearney, Dolores C.; and Matz, Bruno, 4,190,093, Cl. 164-34.000.
Moreno, Isabel L., 4,190,325, Cl. 350-253.000.

Forschungs Institut Fuer Textiltechnologie: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Forster, Denis, to Monsanto Company. Carbonylation process with stabilized catalyst. 4,190,729, Cl. 560-232.000.

Forster, Herbert, to Robert Bosch GmbH. Self-healing electrical capacitor. 4,190,878, Cl. 361-305.000.

Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., to Du Pont de Nemours, E. I., and Company. Centrifugal method and apparatus for processing fluid materials. 4,190,530, Cl. 210-31.00R.

Fory, Werner: *See—*
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,190,433, Cl. 71-100.000.

Foti, Thomas M. Closed flow caloric test method. 4,190,033, Cl. 128-742.000.

Fouinat, Paul: *See—*
Warnet, Henri; and Fouinat, Paul, 4,190,736, Cl. 174-209.000.

Foxboro Company, The: *See—*
Curran, John R., 4,190,848, Cl. 346-145.000.

Frank, Lee F.; and Lee, James K., to Eastman Kodak Company. Piezoelectric power supply for cameras. 4,190,336, Cl. 354-50.000.

Frank, Richard J., to Siemens Aktiengesellschaft. Circuit arrangement and process for producing conference connections between three conference parties in a PCM time multiplex switching system. 4,190,744, Cl. 179-18.0BC.

Frank Speno Railroad Ballast Cleaning Co. Inc.: *See—*
Panetti, Romolo, 4,189,873, Cl. 51-178.000.

Franklin Steel Company: *See—*
Sweeney, Lawrence J., 4,190,118, Cl. 173-130.000.

Frantello, Alfred A., to Corinth Co. Inc. Attachment for drive shaft of rotary lawn mowers. 4,189,905, Cl. 56-295.000.

Freeport Minerals Company: *See—*
Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., 4,190,633, Cl. 423-321.00S.

Frei, Arno, to Sulzer Brothers Limited. Heat exchanger having helically wound tube coils. 4,190,104, Cl. 165-162.000.

Fricke, Klaus: *See—*
Fiedler, Jurgen; and Fricke, Klaus, 4,189,846, Cl. 34-8.000.

Friday, Bruce W., to Xerox Corporation. Lead edge transfer switching. 4,190,348, Cl. 355-3.0TR.

Friday, Robert G.: *See—*
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.
Friedland, Bernard, to Singer Company, The. Nutation damper for two-axis gyroscope. 4,189,947, Cl. 74-5.500.
Fritz, Jack E., to Wolverine Aluminum Corporation. Channel member for siding construction. 4,189,885, Cl. 52-287.000.
Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., to W. R. Grace & Co. Ventilated insulated roofing system. 4,189,886, Cl. 52-302.000.
Frumin, Evgeny I.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Frumin, Isidor I.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Fuji Photo Film Co., Ltd.: *See—*
Naoi, Takashi; and Horie, Ikutaro, 4,190,449, Cl. 430-539.000.
Ohnishi, Masahiro, 4,190,867, Cl. 358-285.000.
Sera, Hidefumi; and Horie, Ikutaro, 4,190,448, Cl. 430-216.000.
Fujikawa, Tetsuzo; and Nishimura, Michio, to Kawasaki Jukogyo Kabushiki Kaisha. Cooling system for liquid-cooled type of two-cycle multicylinder engine. 4,190,023, Cl. 123-41.720.
Fujimoto, Yoshiaki, to Kuraray Co., Ltd. Centrifugal potting apparatus. 4,190,411, Cl. 425-434.000.
Fujisawa, Kenichi. Decorative article assembly. 4,189,857, Cl. 40-158.00R.
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, to Toray Industries, Inc. Polymeric-shaped article. 4,190,689, Cl. 428-20.000.
Fujitsu Limited: *See—*
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,190,789, Cl. 315-169.400.
Yoshikawa, Kazuo; and Andoh, Shizuo, 4,190,788, Cl. 315-169.400.
Fukushima, Isao: *See—*
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.
Funfschilling, Peter, to Sandoz Ltd. Tricyclo[2.2.1.$0^{2,6}$]heptan-3-ones. 4,190,603, Cl. 260-590.00B.
Fuoco, Rolland P.: *See—*
Hart, John A.; and Fuoco, Rolland P., 4,190,696, Cl. 428-306.000.
Furman, Anatoly V.: *See—*
Podboronov, Boris P.; Sokolov, Sergei S.; and Furman, Anatoly V., 4,190,776, Cl. 307-112.000.
Furrer, Frederick J.: *See—*
Mason, LeRoy W.; and Furrer, Frederick J., 4,190,173, Cl. 220-203.000.
Furtado, Anthony E.: *See—*
Sesser, George L.; and Furtado, Anthony E., 4,190,391, Cl. 414-39.000.
Furuhashi, Toshio: *See—*
Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, 4,190,027, Cl. 123-117.00R.
Furuno, Akihisa: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.
Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, 4,190,787, Cl. 313-494.000.
Futagami, Mikio: *See—*
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,190,699, Cl. 428-412.000.
G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,190,163, Cl. 209-535.000.
GAF Corporation: *See—*
Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., 4,190,718, Cl. 526-207.000.
Gainer, Robert E., to Westinghouse Electric Corp. High-density high-conductivity electrical contact material for vacuum interrupters and method of manufacture. 4,190,753, Cl. 200-144.00B.
Gajski, Daniel D., to Burroughs Corporation. Modular modulo 3 module. 4,190,893, Cl. 364-746.000.
Gale, Robert M.; Ben-Dor, Monique; and Keller, Nancy, to Alza Corporation. Ocular therapeutic system for dispensing a medication formulation. 4,190,642, Cl. 424-19.000.
Gallaher, David E.: *See—*
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., 4,190,690, Cl. 428-35.000.
Gallaher, Kantlehner & Associates, Inc.: *See—*
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., 4,190,690, Cl. 428-35.000.
Gallant, James J.; and Childress, Clarence T. Coping with inlaid tile. 4,189,887, Cl. 52-311.000.
Galli, Guido: *See—*
Davies, John E.; and Galli, Guido, 4,190,683, Cl. 427-130.000.
Galloway, Dudley L.; and Donoghue, Robert E., to Westinghouse Electric Corp. Electrical apparatus. 4,190,732, Cl. 174-17.01F.
Gamertsfelder, George R.: *See—*
Ljung, Bo H. G.; and Gamertsfelder, George R., 4,190,364, Cl. 356-350.000.
Gander, Robert J.; and Gurney, John A., to Johnson & Johnson. Retinoic acid derivatives. 4,190,594, Cl. 260-404.000.
Garber, Wilbur A.: *See—*
Cross, Edward F.; and Garber, Wilbur A., 4,190,858, Cl. 358-113.000.
Gauld, Godfrey R.: *See—*
Shaull, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., 4,190,000, Cl. 102-19.200.
Gausepohl, Hermann: *See—*
Kroker, Ruprecht; Sander, Hans; and Gausepohl, Hermann, 4,190,569, Cl. 260-31.600.
Gaylord, Norman G.: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,190,680, Cl. 427-4.000.
Gazda, Chester T.: *See—*
Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, 4,190,088, Cl. 138-126.000.
GEA Luftkuhlergesellschaft Happel GmbH & Co. KG: *See—*
Gerz, Hans-Bernd, 4,190,102, Cl. 165-113.000.
Gebrueder Buehler AG: *See—*
Geissbuhler, Hans, 4,190,230, Cl. 251-36.000.
Geck, Joseph C.; and Hamilton, Floyd E., to Uniroyal, Inc. Apparatus for positioning and curing a pre-shaped tire carcass. 4,190,406, Cl. 425-38.000.
Gedig, Alfred; Becker, Burckhard; and Bauer, Heinz, to C Rob Hammerstein GmbH. Arrangement for arresting a seat of a vehicle. 4,189,957, Cl. 74-535.000.
Gedig, Alfred: *See—*
Bauer, Heinz; Becker, Burckhard; and Gedig, Alfred, 4,190,225, Cl. 248-394.000.
GEFI Gesellschaft fur Industriewarme und Verfahrenstechnik mit Beschrankter Haftung: *See—*
Fiedler, Jurgen; and Fricke, Klaus, 4,189,846, Cl. 34-8.000.
Geiger, Edward C. Misting control. 4,190,201, Cl. 239-65.000.
Geissbuhler, Hans, to Gebrueder Buehler AG. Scavenging air valve for cleaning tubular air filter bodies. 4,190,230, Cl. 251-36.000.
Gendron, Wilfred H., to Westvaco Corporation. Compartmented envelope. 4,190,161, Cl. 206-620.000.
General Electric Company: *See—*
Corsmeier, Robert J.; and Rauf, James P., 4,190,398, Cl. 415-114.000.
DePuy, Robert P.; and Leitten, Arthur H., Jr., 4,190,825, Cl. 340-347.0AD.
Hall, Walter L.; and Humphrey, James S., Jr., 4,190,681, Cl. 427-45.100.
Knight, J. Nelson; and Turner, Roger C., 4,190,305, Cl. 312-214.000.
Krantz, Karl W., 4,190,069, Cl. 137-13.000.
Santiago, Romeo S.; and Decker, Llewellyn, 4,190,762, Cl. 219-245.000.
Schaeffer, Robert L.; and Madan, Bhim S., 4,190,208, Cl. 241-92.000.
Schilling, Jan C.; and Gutknecht, James E., 4,190,397, Cl. 415-112.000.
Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., 4,190,829, Cl. 340-606.000.
Shaw, David G., 4,190,682, Cl. 427-79.000.
Traver, Frank J.; and Cietek, Timothy J., 4,190,688, Cl. 427-391.000.
West, Harrison; and Delaney, Bobby R., 4,189,939, Cl. 73-116.000.
General Foods Corporation: *See—*
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., 4,190,428, Cl. 71-29.000.
Ravallo, Robert J., 4,190,427, Cl. 71-29.000.
General Medical Company: *See—*
Tapper, Robert; Diamond, Arthur S.; and Arora, Ajit S., 4,190,056, Cl. 128-630.000.
General Mills, Inc.: *See—*
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., 4,189,868, Cl. 47-84.000.
General Motors Corporation: *See—*
Bennett, George T.; and Brucken, Byron L., 4,190,141, Cl. 192-84.00C.
Carlson, Clifford R.; and Chiesa, Alan F., 4,190,028, Cl. 123-119.0EC.
Carolus, David T.; and Edwards, Ralph W., 4,190,842, Cl. 343-903.000.
Rogers, David W., 4,190,752, Cl. 200-81.500.
Sheffer, Timothy K., 4,190,618, Cl. 261-50.00R.
Gerz, Hans-Bernd, to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG. Air cooled condenser installation. 4,190,102, Cl. 165-113.000.
Geus, John W.; and Hermans, Leonardus A. M., to Stamicarbon, B.V. Process for preparing catalyst on carrier systems. 4,190,560, Cl. 252-459.000.
Gewartowski, Steve A., to UOP Inc. Hydrocarbon conversion process. 4,190,520, Cl. 208-95.000.
Geyken, Erwin: *See—*
Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, 4,189,803, Cl. 15-302.000.

Gherardi, Paolo; and Ferrari, Giorgio, to Simes Societa Italiana Medicinali e Sintatici S.p.A. Pharmaceutical composition comprising anxiolytic drugs and beta-adrenergic receptor blocking agents. 4,190,654, Cl. 424-244.000.

Giacobbe, Frederick: *See*—
Schmerling, Donald W.; and Giacobbe, Frederick. 4,190,636, Cl. 423-415.00A.

Giamei, Anthony F., to United Technologies Corporation. Rate controlled directional solidification method. 4,190,094, Cl. 164-60.000.

Giannetti, Joseph P.; and Swift, Harold E., to Gulf Research and Development Company. Solvent refined coal process. 4,190,518, Cl. 208-8.0LE.

Gidlof, Karl G.: *See*—
Almer, Bengt O.; and Gidlof, Karl G., 4,190,380, Cl. 404-6.000.

Giersiepen, Gerhard: *See*—
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.

Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, to Akzona Incorporated. Temperature indicating device using a pressure sensitive polyisobutylene adhesive seal. 4,189,942, Cl. 73-356.000.

GIF Gesellschaft fur Ingenieurprojekte Freiburg mbH: *See*—
Kittler, Helmut, 4,189,990, Cl. 98-121.00R.

Gifford-Hill & Company, Inc.: *See*—
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.

Gilbert, Chester L.: *See*—
Belfield, Robert E.; Gilbert, Chester L.; and Bickham, Euland M., 4,190,227, Cl. 248-636.000.

Gill, Robert A.: *See*—
Drennen, Thomas J.; and Gill, Robert A., 4,190,491, Cl. 162-76.000.

Gillett, Kenneth: *See*—
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.

Gillette Company, The: *See*—
Harper, Allan C.; and Buras, Edmund M., Jr., 4,189,832, Cl. 30-34.200.
McCarthy, Edward F., 4,190,052, Cl. 128-368.000.

Gist Brocades N.V.: *See*—
Marx, Arthur F.; and Doodewaard, Jean, 4,190,670, Cl. 424-305.000.

Giudicelli, Don Pierre R. L.: *See*—
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.

Giurtino, Joel F.: *See*—
Herman, Stephen J.; and Giurtino, Joel F., 4,190,087, Cl. 138-96.00R.

Givaudan Corporation: *See*—
Kaiser, Roman; and Naegeli, Peter, 4,190,591, Cl. 260-347.800.

Glackin, Steven. Mattress. 4,189,797, Cl. 5-448.000.

Glass, Irving J. Track light. 4,190,309, Cl. 339-21.00R.

Glover, Robert C., to Fluid Kinetics Corporation. Fluid flow stabilizer and phase separator. 4,190,403, Cl. 417-543.000.

Gneiding, Donald R.: *See*—
Cameron, Albert R.; and Gneiding, Donald R., 4,190,076, Cl. 137-505.450.

Gobel, Wilhelm: *See*—
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.

Godfrey, Charles J. B. Jack. 4,190,233, Cl. 254-4.00B.

Goffredo, Daniel L., to Chemcut Corporation. Apparatus for ion control of solutions. 4,190,481, Cl. 156-345.000.

Gold Kist, Incorporated: *See*—
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,190,577, Cl. 260-123.500.

Goldsmith, Stephen. Microscope and microscope slide for cytological analysis. 4,190,314, Cl. 350-94.000.

Goldstein, Gideon; and Schlesinger, David H., to Sloan-Kettering Institute for Cancer Research. Polypeptide compositions and methods. 4,190,646, Cl. 424-177.000.

Goldstein, Gideon; and Schlesinger, David H., to Sloan-Kettering Institute for Cancer Research. Polypeptides and methods. 4,190,647, Cl. 424-177.000.

Golomazov, Viktor A.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Gonzales-Dorner, Alberto: *See*—
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.

Goodbary, Edgar R.; and Bartley, Francis A., to Goodbary Engineering Co. Off-highway vehicle. 4,190,265, Cl. 280-716.000.

Goodbary Engineering Co.: *See*—
Goodbary, Edgar R.; and Bartley, Francis A., 4,190,265, Cl. 280-716.000.

Goodman, Colin H. L.; and Kirkby, Paul A., to International Standard Electric Corporation. Stripe lasers. 4,190,809, Cl. 331-94.50H.

Goodyear Aerospace Corporation: *See*—
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Gordin, Myron K.: *See*—
Drost, James L.; and Gordin, Myron K., 4,190,881, Cl. 362-250.000.

Gordon, Harry W.; and Amanat, Sharif, to Del Laboratories, Inc. Hair treatment composition and method of treating hair with the same. 4,190,064, Cl. 132-7.000.

Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, to Lipton, Thomas J. Composite fruit gel and ice confection. 4,190,676, Cl. 426-100.000.

Gortsema, Frank P., to Union Carbide Corporation. Process for the preparation of fine grain metal carbide powders and sintered articles therefrom. 4,190,439, Cl. 75-211.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Motor-valve apparatus for hydraulic fan drive system. 4,189,919, Cl. 60-420.000.

Goto, John M.: *See*—
Drzewiecki, Tadeusz M.; and Goto, John M., 4,190,083, Cl. 137-838.000.

Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, to EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH. Grid welding machine. 4,190,758, Cl. 219-56.000.

Goubeaux, Dale C.: *See*—
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Gould Inc.: *See*—
Berdan, Betty L.; and Luce, Betty M., 4,190,474, Cl. 156-151.000.
Lecklider, Thomas H.; and Bowers, John J., 4,190,797, Cl. 324-61.00R.

Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., to Standard Oil Company. Production of unsaturated nitriles using catalysts promoted with various metals. 4,190,556, Cl. 252-432.000.

Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., to Standard Oil Company. Process for the oxidation of olefins using catalysts containing various promoter elements. 4,190,608, Cl. 260-604.00R.

Gray, James W., to Eaton, Thomas J., Jr., a part interest. Device to remove concentric knockouts in electrical apparatus. 4,189,964, Cl. 81-3.00R.

Gray, Lewis, to Westinghouse Electric Corp. Condenser vacuum load compensating system. 4,189,927, Cl. 60-687.000.

Grede Foundries Inc.: *See*—
Allread, John J.; McManamy, Thomas A.; and Peter, Bruno E., 4,190,097, Cl. 164-343.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Kewanee Industries, Inc. Hair conditioning compounds. 4,190,644, Cl. 424-70.000.

Greenleaf, John E.; and Delaplaine, Robert W., to United States of America, National Aeronautics and Space Administration. Sweat collection capsule. 4,190,060, Cl. 128-760.000.

Greshes, Martin. Method for molding optical plastic lenses of the standard and bifocal type. 4,190,621, Cl. 264-1.000.

Grifhorst, Norman J. Game apparatus. 4,190,250, Cl. 273-342.000.

Grimsrud, Lars, to A/S Nycotron. Peristaltic pumping means for blood dialysis. 4,190,536, Cl. 210-93.000.

Grip Tite Mfg. Co.: *See*—
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.

Grivsky, Eugene M., to Burroughs Wellcome Co. 3-Fluoro-N-cyclopropylcinnamide. 4,190,674, Cl. 424-324.000.

Grodzka, Philomena G.: *See*—
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., 4,189,848, Cl. 34-32.000.

Groshens, Pierre, to Lainiere de Picardie. Complex stitch fabric of fluffy character for lining and reinforcing apparel and method of making same. 4,189,931, Cl. 66-193.000.

Gross, David; and Jorgensen, Hugh V. Friction support device. 4,190,274, Cl. 292-338.000.

Grossman, Norman R.: *See*—
Stahle, Howard L.; and Grossman, Norman R., 4,190,831, Cl. 340-707.000.

Grudzinskas, Charles V.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.

Grumman Aerospace Corporation: *See*—
Marx, Warren G., 4,190,890, Cl. 364-491.000.

Grundig E.M.V. Elektro-Mechanische Versuchsanstalt: *See*—
Schenke, Walter; and Krauss, Gerhard, 4,189,788, Cl. 2-209.000.

Grundmann, Edgard: *See*—
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,190,038, Cl. 126-445.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., 4,190,745, Cl. 179-18.0AH.

GTE Sylvania Incorporated: *See*—
Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., 4,190,790, Cl. 315-313.000.
Shaffer, John W.; and Bricker, Daniel W., 4,190,413, Cl. 431-362.000.

Gubser, Donald U.: *See*—
Howe, David G.; and Gubser, Donald U., 4,190,701, Cl. 428-662.000.

Guenther, Joachim, to Xerox Corporation. Sheet receiving apparatus. 4,190,247, Cl. 271-291.000.

Guenther, Joachim: *See*—
Smith, Craig A.; and Guenther, Joachim, 4,190,354, Cl. 355-3.0SH.

Guess, Joe F., to Telex Communications, Inc. Piezoelectric ceramic resonant transducer with stable frequency. 4,190,782, Cl. 310-324.000.

Gulf Oil Corporation: *See—*
Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., 4,190,429, Cl. 71-67.000.

Gulf Research and Development Company: *See—*
Giannetti, Joseph P.; and Swift, Harold E., 4,190,518, Cl. 208-8.0LE.

Gunning, Samuel D., to Kent Air Tool Company. Air hammer and muffler combination. 4,189,917, Cl. 60-370.000.

Gurney, John A.: *See—*
Gander, Robert J.; and Gurney, John A., 4,190,594, Cl. 260-404.000.

Guthmann, Stephen F. Boat mooring apparatus. 4,190,011, Cl. 114-230.000.

Guthohrlein, Gerhard: *See—*
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.

Gutknecht, James E.: *See—*
Schilling, Jan C.; and Gutknecht, James E., 4,190,397, Cl. 415-112.000.

Gutner, Kenneth H. Adjustable mechanism for guard rail of a bunk bed. 4,189,796, Cl. 5-8.000.

H. K. Porter Company, Inc.: *See—*
Hintz, Carman R.; and Jahns, Warren K., 4,189,977, Cl. 85-70.000.

Haamann, Josef: *See—*
Wenzel, Joerg; and Mai, Erich, 4,190,135, Cl. 187-1.00R.

Haarmann & Reimer GmbH: *See—*
Bauer, Kurt; and Molleken, Reiner, 4,190,583, Cl. 260-340.50R.

Hackett, James E., to Lockheed Corporation. Vortex diffuser. 4,190,219, Cl. 244-199.000.

Hackl, Helmut: *See—*
Brabetz, Bernhard; and Hackl, Helmut, 4,190,386, Cl. 408-1.00R.

Haddad, Adrien, to Officine Cimbali Giuseppe S.p.A. Pressurized fluid supply and control device, particularly for coffee-making machines. 4,189,991, Cl. 99-302.00R.

Hadden, Stephen C.: *See—*
Hulls, Leonard R.; Hadden, Stephen C.; and Armstrong, Lee R., 4,189,940, Cl. 73-117.300.

Haga, Kyosuke: *See—*
Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, 4,189,963, Cl. 74-821.000.

Hagemann, Hermann: *See—*
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,190,710, Cl. 521-89.000.

Hager, Clarence L.; and Jensen, Ronald P. Posterior lens implant tool. 4,190,049, Cl. 128-303.00R.

Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, to Licentia Patent-Verwaltungs-G.m.b.H. Method and apparatus for braking rail-guided vehicles automatically and accurately with respect to a deceleration distance. 4,190,220, Cl. 246-182.00B.

Haimowitz, Irwin, to Thermo-Seal, Inc. Drinking receptacle cover with a lip operated valve. 4,190,174, Cl. 220-254.000.

Halbfoster, Christopher J., to Ecodyne Corporation. Charged filter aid material and ion exchange bed. 4,190,532, Cl. 210-75.000.

Hall, Raymond M. Bump board marble game. 4,190,251, Cl. 273-124.00R.

Hall, Walter L.; and Humphrey, James S., Jr., to General Electric Company. Method of coating a polycarbonate substrate with glass. 4,190,681, Cl. 427-45.100.

Halliburton Company: *See—*
Loesch, Stanley B., 4,189,941, Cl. 73-231.00R.

Halm Instrument Co., Inc.: *See—*
Harrison, Henry; and Harrison, Henry C., 4,189,882, Cl. 52-222.000.
Harrison, Henry, 4,190,084, Cl. 137-883.000.

Halonen, Tuomo, to Okuli Oy. Strip made up of consecutive package blanks. 4,190,190, Cl. 229-17.00R.

Halton Oy: *See—*
Hasa, Juhani; and Tolmunen, Arvi, 4,190,085, Cl. 138-45.000.

Hamada, Hakusei: *See—*
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.

Hamberg, Mats A.: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.

Hamilton, Alexander; and Nelson, Colin, to Ciba-Geigy Corporation. Dialysis monitored preparation of metal salts of azo pigments. 4,190,578, Cl. 260-150.000.

Hamilton, Floyd E.: *See—*
Geck, Joseph C.; and Hamilton, Floyd E., 4,190,406, Cl. 425-38.000.

Hamlin, Ralston L.: *See—*
Emmerich, Kenneth C.; and Hamlin, Ralston L., 4,190,125, Cl. 175-410.000.

Hammann, Ingeborg: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Hammarstrom, Sven R.: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.

Hammerli, Martin: *See—*
Butler, John P.; and Hammerli, Martin, 4,190,515, Cl. 204-266.000.

Haney, Fred H. Mineral stabilized resin emulsion. 4,190,568, Cl. 260-29.6XA.

Hanlon, Alfred G., to NCR Corporation. Multiple component circuit board cooling device. 4,190,098, Cl. 165-1.000.

Hansson, Hans M. Device for transport of bulk material or the like. 4,190,147, Cl. 198-746.000.

Hanusiak, William M.: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,190,079, Cl. 137-561.00R.

Harada Industry Co., Ltd.: *See—*
Harada, Jiro, 4,190,841, Cl. 343-903.000.

Harada, Jiro, to Harada Industry Co., Ltd. Car antenna system with bimetallic control means. 4,190,841, Cl. 343-903.000.

Hard af Segerstad, Sverker; and Nilsson, Olle. Device for establishing a condition at the surface of a subject. 4,190,367, Cl. 356-354.000.

Hardman, Harley F.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,190,608, Cl. 260-604.00R.

Hardtmann, Goetz E., to Sandoz, Inc. Pharmaceutical preparation and use of 4-hydroxy-2-quinolinone-3-carboxylic acid esters. 4,190,659, Cl. 424-258.000.

Hardy, Terence: *See—*
Litchfield, Leon G.; and Hardy, Terence, 4,190,306, Cl. 312-330.00R.

Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., to Corning Glass Works. Photochromic glass. 4,190,451, Cl. 106-47.00Q.

Harman, Galen B.: *See—*
Stroup, Steven L.; and Harman, Galen B., 4,190,407, Cl. 425-110.000.

Harper, Allan C.; and Buras, Edmund M., Jr., to Gillette Company, The. Shaving implement. 4,189,832, Cl. 30-34.200.

Harris, Bernard, to Rexnord Inc. Fabric-lined epoxy resin cylinder with lubricant retaining grooves. 4,189,985, Cl. 92-153.000.

Harrison, Earl K.: *See—*
Mullane, George W.; and Harrison, Earl K., 4,190,388, Cl. 408-188.000.

Harrison, Henry; and Harrison, Henry C., to Halm Instrument Co., Inc. Translucent roofing means. 4,189,882, Cl. 52-222.000.

Harrison, Henry, to Halm Instrument Co., Inc. Flow control means. 4,190,084, Cl. 137-883.000.

Harrison, Henry C.: *See—*
Harrison, Henry; and Harrison, Henry C., 4,189,882, Cl. 52-222.000.

Harrison, Wayne O. Well cleanout tool. 4,190,113, Cl. 166-311.000.

Hart, John A.; and Collyer, John C., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Chemical resistant article. 4,190,685, Cl. 427-302.000.

Hart, John A.; and Fuoco, Rolland P., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Flame resistant, gas resistant foam material. 4,190,696, Cl. 428-306.000.

Hartman, Calvin J. Optical testing of surface flatness. 4,190,365, Cl. 356-352.000.

Hartmann, Werner, to Swakopmund AG. Heat exchanger tube base. 4,190,101, Cl. 165-82.000.

Harvey, Robert J.: *See—*
Hill, J. Donald; Harvey, Robert J.; and Downie, David E., 4,190,057, Cl. 128-675.000.

Harwood, Hugh D.; Pao, Joseph Y. C.; and Stebbings, David W. Diaphragm material for moving coil loudspeaker, may be laminated or integral with surround. 4,190,746, Cl. 179-115.50R.

Hasa, Juhani; and Tolmunen, Arvi, to Halton Oy. Gas flow regulating and measuring apparatus. 4,190,085, Cl. 138-45.000.

Hascoe, Norman, to Semi-Alloys, Inc. Sealing cover unit for a container for a semiconductor device. 4,190,176, Cl. 220-359.000.

Hashimoto, Naoto; and Kishi, Toyokazu, to Takeda Chemical Industries, Ltd. Optically active maytansinoids and maytansinoid production method. 4,190,580, Cl. 260-239.30P.

Hashimoto, Naoto: *See—*
Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,190,656, Cl. 424-251.000.

Hatch, Gary L., to Aqua-Chem, Inc. Mixed-form polyhalide resins for disinfecting water. 4,190,529, Cl. 210-29.000.

Hattori, Hiroyuki: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.

Hauni-Werke Korber & Co. KG.: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Hauser, William C.: *See—*
Casuga, Dennis W.; and Hauser, William C., 4,190,198, Cl. 236-34.500.

Hawker Siddeley Dynamics Engineering, Ltd.: *See—*
Coles, Ernest F., 4,190,081, Cl. 137-624.270.

Hawkins, Donald. Sliding window channel lock. 4,190,271, Cl. 292-145.000.

Hawley, Wilbur W., to Atlantic Richfield Company. Photovoltaic roof construction. 4,189,881, Cl. 52-220.000.

Hay, William D.: *See—*
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.

Hayden, George S.: *See*—
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.
Haynes, John A., to Danek Industries, Inc. Grader blade attachment. 4,189,854, Cl. 37-117.500.
Heath Consultants, Incorporated: *See*—
Heim, Paul M., 4,189,938, Cl. 73-40.700.
Heckmaier, Manfred: *See*—
Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, 4,190,387, Cl. 409-33.000.
Hedger, Bruce W., to Alpha-Omega Services, Inc. Method for removing metallic seeds from nylon tubing used in interstitial brachytherapy. 4,190,461, Cl. 134-1.000.
Hedges, Rhey W.: *See*—
Parker, Louis W.; and Hedges, Rhey W., 4,190,793, Cl. 318-800.000.
Hedstrom Co.: *See*—
Boucher, Raymond W., 4,190,283, Cl. 297-77.000.
Heger, Adolf: *See*—
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.
Hehl, Karl. Apparatus for injecting confluent streams of plastic. 4,190,409, Cl. 425-132.000.
Heiba, El-Ahmadi I.; and Williams, Albert L., to Mobil Oil Corporation. Method of preparing a substituted butyrolactone acetic acid. 4,190,588, Cl. 260-343.600.
Heim, Paul M., to Heath Consultants, Incorporated. Double tracer gas process for locating conduit leaks. 4,189,938, Cl. 73-40.700.
Heinzelmann, Walter: *See*—
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.
Heisterkamp, Wilhelm: *See*—
Lagemann, Gunther; and Heisterkamp, Wilhelm, 4,190,497, Cl. 202-150.000.
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, to Volkswagenwerk Aktiengesellschaft. Solar heater. 4,190,038, Cl. 126-445.000.
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, to Hauni-Werke Korber & Co. KG. Method and apparatus for producing a rod-like tobacco filler. 4,190,061, Cl. 131-21.00B.
Helmick, B. J. Patio door roller assembly. 4,189,870, Cl. 49-420.000.
Hendricks, Charles D., to United States of America, Energy. Cryogenic target formation using cold gas jets. 4,190,016, Cl. 118-724.000.
Hennessy, James J., to Hennessy Products, Incorporated. Railway car door moving means. 4,189,869, Cl. 49-358.000.
Hennessy Products, Incorporated: *See*—
Hennessy, James J., 4,189,869, Cl. 49-358.000.
Herman, Stephen J.; and Giurtino, Joel F., to Cobe Laboratories, Inc. Breather cap. 4,190,087, Cl. 138-96.00R.
Hermans, Leonardus A. M.: *See*—
Geus, John W.; and Hermans, Leonardus A. M., 4,190,560, Cl. 252-459.000.
Hernandez Crespo, Mariano, to Empresa Nacional de Ingenieria y Tecnologia, S.A. Adjustable distribution valve. 4,190,082, Cl. 137-625.170.
Hertel, Douglas L., to International Basic Economy Corporation. Process for recovering proteins and polymers from liquids containing same. 4,190,721, Cl. 528-486.000.
Herzog Contracting Corporation: *See*—
Herzog, Stanley M.; and Poggemiller, Randy L., 4,190,394, Cl. 414-786.000.
Herzog, Stanley M.; and Poggemiller, Randy L., to Herzog Contracting Corporation. Method for loading and unloading railroad cars. 4,190,394, Cl. 414-786.000.
Hesky, Hans; and Wunderer, Armin, to Hoechst Aktiengesellschaft. Process for concentrating tritium and/or tritium hydride and separating it from tritium water. 4,190,507, Cl. 204-129.000.
Hewlett-Packard Company: *See*—
Sherman, Allan P., 4,190,886, Cl. 364-415.000.
Hibino, Yutaka: *See*—
Takeda, Kazutoki; Negishi, Yasuo; and Hibino, Yutaka, 4,190,485, Cl. 156-583.900.
Hickey, Dana, to Ski Tree, Inc. Ski carrier. 4,190,182, Cl. 224-45.00S.
Hicks, James E., to RCA Corporation. Switching regulator for television deflection circuit with improved ...ltor voltage regulation. 4,190,791, Cl. 315-408.000.
Higley, Faith. Covered, portable insulated plate. 4,190,155, Cl. 206-445.000.
Hill, J. Donald; Harvey, Robert J.; and Downie, David E., to Thoratec Laboratories Corporation. Device for determining the patentcy of a blood vessel. 4,190,057, Cl. 128-675.000.
Hillman, Gary, to Machine Technology, Inc. Apparatus for dispensing liquid to spinning workpieces. 4,190,015, Cl. 118-696.000.
Himmetsberger, Alois; and Wittmann, Heinz, to TMC Corporation. Safety ski binding. 4,190,264, Cl. 280-618.000.
Hintz, Carman R.; and Jahns, Warren K., to H. K. Porter Company, Inc. Weather tight blind fastener. 4,189,977, Cl. 85-70.000.
Hiraide, Takashi: *See*—
Imamura, Tetsuya; and Hiraide, Takashi, 4,190,549, Cl. 252-91.000.
Hirakoso, Keiichiro: *See*—
Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, 4,190,760, Cl. 219-128.000.
Hiramatsu, Yoshiharu: *See*—
Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, 4,190,728, Cl. 560-168.000.
Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Deformable impact absorbing device for vehicles. 4,190,276, Cl. 293-133.000.
Hirata, Yasuyuki: *See*—
Tominaga, Akira; and Hirata, Yasuyuki, 4,190,564, Cl. 260-18.0PT.
Hirayama, Kazuyoshi: *See*—
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, 4,190,329, Cl. 350-338.000.
Hirs, Gene, to AMSTED Industries Incorporated. Filter method. 4,190,533, Cl. 210-80.000.
Hirsch, Peter: *See*—
Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, 4,189,813, Cl. 29-156.80R.
Hirtz, Russell E.: *See*—
Walters, Robert A.; and Hirtz, Russell E., 4,190,055, Cl. 128-419.0PT.
Hitachi, Ltd.: *See*—
Hongo, Mikio; and Nakabayashi, Junichi, 4,190,759, Cl. 219-121.0LM.
Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, 4,190,027, Cl. 123-117.00R.
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, 4,190,396, Cl. 415-110.000.
Hitzrot, Henry W., Jr., to Bethlehem Steel Corporation. Metallic abrasive produced from a steel mill waste material. 4,190,422, Cl. 51-309.000.
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, to U.S. Philips Corporation. Tape recorder stopping mechanism. 4,190,215, Cl. 242-186.000.
Hocker, Harvey L.: *See*—
Williamson, Clifton L.; Hocker, Harvey L.; and Alcamo, John M., 4,189,793, Cl. 4-228.000.
Hodgkin, Jonathan H., to Commonwealth Scientific and Industrial Research Organization. Mercury and copper selective metal chelating resins. 4,190,709, Cl. 521-39.000.
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, to Smith & Nephew Research Ltd. Disposable column. 4,190,542, Cl. 210-282.000.
Hoechst Aktiengesellschaft: *See*—
Hesky, Hans; and Wunderer, Armin, 4,190,507, Cl. 204-129.000.
Landauer, Franz, 4,190,600, Cl. 260-544.00D.
Hoekje, Howard H.; and May, Russell R., to PPG Industries, Inc. Production of hypochlorous acid. 4,190,638, Cl. 423-473.000.
Hoeksema, Norman L.: *See*—
Bronkema, James W.; and Hoeksema, Norman L., 4,190,408, Cl. 425-145.000.
Hoenig, Stuart A.: *See*—
Smart, William L.; and Hoenig, Stuart A., 4,190,875, Cl. 361-228.000.
Hoese, Thomas C.: *See*—
Turpin, Charles H.; and Hoese, Thomas C., 4,190,757, Cl. 219-10.55E.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with O-phenyl-thionothiolalkanephosphonic acid esters. 4,190,652, Cl. 424-222.000.
Hoffman, Jay; and Ferriss, Lincoln S., to Singer Company, The. Three axis gyro. 4,189,946, Cl. 74-5.400.
Hoffmann-La Roche Inc.: *See*—
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,190,587, Cl. 260-343.30P.
Hofmann, Eberhard; and Weyrich, Erwin, to Robert Bosch GmbH. Lock assembly for a drive shaft of a fuel injection pump for internal combustion engines. 4,190,401, Cl. 417-313.000.
Hofstetter, Jack H., to American Hospital Supply Corporation. Urine collection container with coupling for suspension line. 4,189,789, Cl. 4-144.100.
Hogan, Philip J.: *See*—
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,190,616, Cl. 260-945.000.
Hoganas AB Fack: *See*—
Tengzelius, Jan R.; and Fayles, Robert R., 4,190,441, Cl. 75-251.000.
Holdeman John W., to Borg-Warner Corporation. Underdrive transmission with sun gear and carrier slidable as a subassembly. 4,189,960, Cl. 74-781.00R.
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, to Hoffmann-La Roche Inc. 4-(3-Oxo-4-trifluoromethyl-1-octenyl)-2-oxo-2H-cyclopenta[b]furans. 4,190,587, Cl. 260-343.30P.
Holloway, David J., to USM Corporation. Hand operated lockbolt setting tool. 4,189,933, Cl. 72-391.000.
Holstein, Siegbert, to Dr. Johannes Heidenhain GmbH. Scanning unit. 4,189,840, Cl. 33-125.00C.
Holt, Charles P.: *See*—
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.
Holt, Gregory G., to Colonics Diversified, Inc. Apparatus for colonic lavage and specimen collection. 4,190,059, Cl. 128-750.000.

Holznagel, Uwe: *See*—
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Homeyer, Bernhard: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Honeywell Inc.: *See*—
Swarbrick, Richard, 4,190,822, Cl. 340-210.000.
Upton, Robert W., Jr., 4,190,318, Cl. 350-96.200.

Honeywell Information Systems Inc.: *See*—
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,190,901, Cl. 365-72.000.
Joyce, Thomas F.; and Panepinto, William, Jr., 4,190,885, Cl. 364-200.000.

Hongo, Mikio; and Nakabayashi, Junichi, to Hitachi, Ltd. Processing of photomask. 4,190,759, Cl. 219-121.0LM.

Honshuseishi Kabushiki Kaisha: *See*—
Ohmori, Koichiro, 4,190,188, Cl. 229-5.600.

Hooker Chemicals & Plastics Corp.: *See*—
Lin, Henry C., 4,190,609, Cl. 260-650.00R.

Hope, Henry F.; and Hope, Stephen F. Mixing pump system. 4,190,617, Cl. 261-28.000.

Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 4,190,617, Cl. 261-28.000.

Horak, Josef: *See*—
Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, 4,190,694, Cl. 428-212.000.

Horie, Ikutaro: *See*—
Naoi, Takashi; and Horie, Ikutaro, 4,190,449, Cl. 430-539.000.
Sera, Hidefumi; and Horie, Ikutaro, 4,190,448, Cl. 430-216.000.

Horlein, Ulrich: *See*—
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Hormel, Thad S.: *See*—
Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., 4,190,605, Cl. 260-600.00R.

Horn, Stuart B.: *See*—
Dunmire, Howard L.; and Horn, Stuart B., 4,190,106, Cl. 165-185.000.

Hotta, Hiroshi: *See*—
Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, 4,190,687, Cl. 427-389.000.

Howe, David G.; and Gubser, Donald U., to United States of America, Navy. V$_3$Ga Composite superconductor. 4,190,701, Cl. 428-662.000.

Howmet Turbine Components Corporation: *See*—
Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, 4,190,450, Cl. 106-38.900.

Hoyt, Jerry L., to Mark Controls Corporation. Encapsulated underground liquid storage tank. 4,190,159, Cl. 206-524.000.

Hrabal, Zdenek: *See*—
Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, 4,190,694, Cl. 428-212.000.

Hsu, James J., to Westinghouse Electric Corp. Turbine-condenser support system. 4,189,926, Cl. 60-687.000.

Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, to Societe Anonyme Dite: La Telephonie Industrielle et Commerciale-Telic. Thyristor switching matrix. 4,190,743, Cl. 179-18.0GF.

Hughes Aircraft Company: *See*—
Bayley, Allan E., 4,190,810, Cl. 331-94.5PE.
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., 4,190,882, Cl. 363-26.000.
Finnila, Ronald M.; and Su, Stephen C., 4,190,851, Cl. 357-30.000.
Kyle, Nance R., 4,190,486, Cl. 156-601.000.
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,487, Cl. 156-617.0SP.
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,640, Cl. 423-500.000.

Hughes, Charles F. M. Word game apparatus. 4,190,255, Cl. 273-272.000.

Hughes, Nathaniel, to Hughes Sciences Group, Inc. Vortex generating device with resonator. 4,190,203, Cl. 239-102.000.

Hughes, Richard S., to United States of America, Navy. Deformable liquid mirror. 4,190,327, Cl. 350-310.000.

Hughes, Robert M. Air mix agitation for the extraction of metals from leachable ores. 4,190,436, Cl. 75-105.000.

Hughes Sciences Group, Inc.: *See*—
Hughes, Nathaniel, 4,190,203, Cl. 239-102.000.

Hughes, Thomas R.: *See*—
Miller, Stephen J.; and Hughes, Thomas R., 4,190,519, Cl. 208-79.000.

Hulls, Leonard R.; Hadden, Stephen C.; and Armstrong, Lee R., to RCA Corporation. Engine fault diagnosis. 4,189,940, Cl. 73-117.300.

Humphrey, James S., Jr.: *See*—
Hall, Walter L.; and Humphrey, James S., Jr., 4,190,681, Cl. 427-45.100.

Hunt, Charles T.: *See*—
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., 4,190,577, Cl. 260-123.500.

Hunt, Claude J. L. Vacuum metallizing interior of hollow article with masking shield. 4,190,019, Cl. 118-720.000.

Hunter, Donald N.; and Wyatt, Lesley J., to Rosemount Engineering Company Limited. Casting and moulding compositions. 4,190,453, Cl. 106-85.000.

Hurnik, Helmut: *See*—
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,190,710, Cl. 521-89.000.

Hurst, George T.: *See*—
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.

Hutson, Jearld L. Multilayer semiconductor switching devices. 4,190,853, Cl. 357-39.000.

Hutson, John W.; and Neal, Robert L. Automated clean-out system for film processors. 4,190,346, Cl. 354-324.000.

Hwa, Chih M., to Chemed Corporation. Fireside treating compositions. 4,190,421, Cl. 44-4.000.

Hyche, Kenneth W.: *See*—
Cook, Mary J.; and Hyche, Kenneth W., 4,190,565, Cl. 260-27.00R.

I.S.C. Alloys Limited: *See*—
Wyatt, Brian S.; and Wassell, Ronald H., 4,190,512, Cl. 204-196.000.

Iantorno, James, to Sealectro Corporation. Female electrical connector. 4,190,308, Cl. 339-19.000.

Ibragimov, Dias A.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, to Kawasaki Steel Corporation. Method for forming forsterite insulating film on an oriented silicon steel sheet. 4,190,469, Cl. 148-113.000.

Ichikawa, Kiyoshi: *See*—
Yamada, Shigeru; and Ichikawa, Kiyoshi, 4,189,972, Cl. 84-1.250.

ICI Australia Limited: *See*—
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.

Ickes, Charles W.: *See*—
Meece, Meredith W.; Ickes, Charles W.; and Moore, Fred H., 4,190,402, Cl. 417-415.000.

Iglesias, Jose J. Lithotrite for electrohydraulic cystolithotripsy. 4,190,051, Cl. 128-328.000.

Iida, Toshihide: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.

Iizuka, Yoshikatsu: *See*—
Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, 4,190,877, Cl. 361-298.000.

Ikeda, Jiro, to Sony Corporation. Method of manufactureing a record matrix. 4,190,503, Cl. 204-5.000.

Imamura, Eigo, to Sanyo Electric Company, Ltd. Multifrequency superheterodyne receiver with priority channel monitoring. 4,190,803, Cl. 325-455.000.

Imamura, Tetsuya; and Hiraide, Takashi, to Kao Soap Co., Ltd. Soap for scouring pad. 4,190,549, Cl. 252-91.000.

Imperial Chemical Industries Limited: *See*—
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,190,616, Cl. 260-945.000.

Inada, Tetsuro: *See*—
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.

Ingalls, Paul H.: *See*—
Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., 4,190,790, Cl. 315-313.000.

Inoue, Masakazu: *See*—
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.

Inoue, Yukihiro, to Sharp Kabushiki Kaisha. Installation of a semiconductor chip on a glass substrate. 4,190,855, Cl. 357-80.000.

Institut Kibernetiki Akademii Nauk Ukrainskoi S S R: *See*—
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,190,888, Cl. 364-497.000.

Institute of Gas Technology: *See*—
Yie, Gene G., 4,190,202, Cl. 239-101.000.

Instytut Przemysku Organicznega: *See*—
Leszczynska, Halina; and Leszczynski, Jerzy, 4,190,627, Cl. 422-40.000.

International Basic Economy Corporation: *See*—
Hertel, Douglas L., 4,190,721, Cl. 528-486.000.

International Business Machines Corporation: *See*—
Avina, Raymond; and Merrell, Patrick F., 4,190,870, Cl. 360-98.000.
Bhattacharyya, Arup; and Wiedman, Francis W., III, 4,190,466, Cl. 148-1.500.
Cooper, Leon M.; and Wipke, Walter J., 4,190,845, Cl. 346-75.000.
Davies, John E.; and Galli, Guido, 4,190,683, Cl. 427-130.000.
Jones, Robert E., Jr.; and Nystrom, Walther, 4,190,872, Cl. 360-125.000.
Van Voorhis, David C., 4,190,900, Cl. 365-15.000.
Winters, Harold F., 4,190,488, Cl. 156-643.000.

International Computers Limited: *See*—
Berry, George A., 4,190,375, Cl. 403-7.000.

International Harvester Company: *See*—
Amberg, Arthur A.; and Zetterlund, Ture R., 4,189,987, Cl. 98-2.140.

International Standard Electric Corporation: *See*—
Goodman, Colin H. L.; and Kirkby, Paul A., 4,190,809, Cl. 331-94.50H.

Taylor, Terrence F. E., 4,190,844, Cl. 346-75.000.

International Telephone and Telegraph Corporation: *See*—
Dean, Robert H.; and Dyer, Oliver Q., 4,190,071, Cl. 137-115.000.
Meece, Meredith W.; Ickes, Charles W.; and Moore, Fred H., 4,190,402, Cl. 417-415.000.
Wallace, Charles H., 4,190,100, Cl. 165-48.00R.

Intersil, Inc.: *See*—
Bingham, David, 4,190,805, Cl. 330-9.000.

Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, to Hitachi, Ltd. Electronic spark timing advancing apparatus. 4,190,027, Cl. 123-117.00R.

Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Powder coating resin process containing an aromatic carbonamide condensate. 4,190,714, Cl. 525-163.000.

Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Powder coating resin composition containing a dicarbonamide or polycarbonamide condensate. 4,190,715, Cl. 525-163.000.

Ishiguro, Yasuo; and Wakazono, Kenji, to Copal Company Limited. Driving circuit for camera shutters. 4,190,344, Cl. 354-234.000.

Ishihara, Satoshi: *See*—
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.

Ishii, Akira, to Tokyo Shibaura Electric Company, Limited. Pressure detecting apparatus having linear output characteristic. 4,190,796, Cl. 323-75.00N.

Ishii, Masao: *See*—
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.

Ishizaki, Shunji: *See*—
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, 4,190,572, Cl. 264-46.400.

Iten, Clemens A.; and Campbell, Christopher J., to American Safety Razor Company. Dual purpose cutter package/guard. 4,189,829, Cl. 30-151.000.

Ito, Akira; and Iwata, Kenji, to Mitsui Toatsu Chemicals, Incorporated. Method for the production of low density copolymers of ethylene. 4,190,614, Cl. 525-106.000.

Ito, Shigeyasu: *See*—
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.

Ito, Takefumi: *See*—
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.

Itoh, Takayuki: *See*—
Ogawa, Ryota; and Itoh, Takayuki, 4,190,323, Cl. 350-184.000.

Itoi, Kazuo: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.

Iwata, Kenji: *See*—
Ito, Akira; and Iwata, Kenji, 4,190,614, Cl. 525-106.000.

J. M. Voith GmbH: *See*—
Tra, Josef, 4,190,522, Cl. 209-170.000.

Jackes-Evans Manufacturing Company: *See*—
Cornwell, Alexander M., Jr.; and Miller, Joseph N., 4,190,192, Cl. 232-17.000.

Jackson, Harold P.; and Rhinehart, Richard W., to McDonough Power Equipment, Division of Fuqua Industries, Inc. Rotary lawn mower with removable mulching attachment. 4,189,903, Cl. 56-255.000.

Jackson, Norman F.: *See*—
Brettle, Jack; and Jackson, Norman F., 4,190,315, Cl. 350-96.120.

Jacob, Louis, to Compagnie Generale d'Electricite. Laser head. 4,190,812, Cl. 331-94.50P.

Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, to University of Utah. Method and apparatus for peritoneal dialysis. 4,190,047, Cl. 128-213.00A.

Jacques, Pierre. Label for returnable and refillable bottle and associated method. 4,190,168, Cl. 215-12.00R.

Jahns, Warren K.: *See*—
Hintz, Carman R.; and Jahns, Warren K., 4,189,977, Cl. 85-70.000.

James, Douglas J.: *See*—
Alcock, A. John; Corkum, Paul B.; and James, Douglas J., 4,190,811, Cl. 331-94.50M.

Jancik, Frank, Jr. Panel carrying device. 4,190,278, Cl. 294-26.000.

Janzen, Harlo W. Reel mounting apparatus. 4,190,211, Cl. 242-86.700.

Jenkins, Hugh N.; and Black, Robert P. Industrial dust collector cleaning system and method. 4,190,014, Cl. 116-266.000.

Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., to Imperial Chemical Industries Limited. Phosphinite and phosphonite compounds. 4,190,616, Cl. 260-945.000.

Jensen, Ronald P.: *See*—
Hager, Clarence L.; and Jensen, Ronald P., 4,190,049, Cl. 128-303.00R.

Jentoft, Arthur P.; Anghinetti, Joseph P.; and Couture, Paul A., to York Manufacturing, Inc. Expansion joint cover. 4,189,877, Cl. 52-58.000.

Jernow, Jane L.: *See*—
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,190,587, Cl. 260-343.30P.

Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, to Chemische Fabrik Kalk GmbH. Process for suppressing dust in mines. 4,190,292, Cl. 299-12.000.

Johansson, Kurt E. Device for securing a load on a vehicle. 4,190,262, Cl. 410-37.000.

John Wyeth & Brother Limited: *See*—
Weston, George O., 4,190,584, Cl. 548-236.000.

Johnson, Clarence E.: *See*—
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.

Johnson, Donald R.: *See*—
Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., 4,190,530, Cl. 210-31.00R.

Johnson & Johnson: *See*—
Gander, Robert J.; and Gurney, John A., 4,190,594, Cl. 260-404.000.

Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., to Grip Tite Mfg. Co. Method for anchoring and straightening walls. 4,189,891, Cl. 52-742.000.

Johnson, Robert B.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. Printed circuit board apparatus which facilitates fabrication of units comprising a data processing system. 4,190,901, Cl. 365-72.000.

Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, to Uddeholms Aktiebolag. Process for the production of ferro alloys. 4,190,435, Cl. 75-12.000.

Jones, Geoffrey G.: *See*—
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.

Jones, Robert E., Jr.; and Nystrom, Walther, to International Business Machines Corporation. Thin film inductive transducer. 4,190,872, Cl. 360-125.000.

Jordan, Lawrence E.: *See*—
Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., 4,190,829, Cl. 340-606.000.

Jorgensen, Hugh V.: *See*—
Gross, David; and Jorgensen, Hugh V., 4,190,274, Cl. 292-338.000.

Joy Manufacturing Company: *See*—
Loftis, James B.; and Lewis, Norlin O., 4,190,119, Cl. 173-149.000.

Joyce, Thomas F.; and Panepinto, William, Jr., to Honeywell Information Systems Inc. Out of store indicator for a cache store in test mode. 4,190,885, Cl. 364-200.000.

Jumer, John F. Apparatus for containerless portable electro-polishing. 4,190,513, Cl. 204-224.00R.

Jung, Michel: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,190,586, Cl. 260-326.450.

Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., to GTE Automatic Electric Laboratories Incorporated. Call for service and continuity sensor circuit. 4,190,745, Cl. 179-18.0AH.

Kabashima, Ryuichi, to Tokiwa Industrial Co., Ltd. Rotary abrasive drilling bit. 4,190,126, Cl. 175-410.000.

Kabbe, Hans-Joachim: *See*—
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.

Kablitz, Carl: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.

Kaburagi, Hisashi: *See*—
Yamashita, Toshio; and Kaburagi, Hisashi, 4,189,961, Cl. 74-798.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kondo, Kenichi, 4,189,910, Cl. 58-38.00R.

Kabushiki Kaisha Morita Seisakusho: *See*—
Sugai, Hiroshi; and Ogawa, Haruo, 4,189,836, Cl. 433-127.000.

Kaebernick, Hartmut: *See*—
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Kaetzel, Pierre, to Samibem, S.A. Mower-conditioner. 4,189,902, Cl. 56-15.600.

Kahl, John S.: *See*—
Fernandez, Ramon J.; and Kahl, John S., 4,190,072, Cl. 137-236.00S.

Kaiser, Roman; and Naegeli, Peter, to Givaudan Corporation. Odorant and flavorant. 4,190,591, Cl. 260-347.800.

Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, to Tokuyama Soda Kabushiki Kaisha. Cathode. 4,190,516, Cl. 204-290.00R.

Kalosha, Alexei S.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.

Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Radiation detection element. 4,190,771, Cl. 250-385.000.

Kametani, Hiroshi; and Mitsuma, Tatsuya, to National Research Institute for Metals. Process for removing chalcophile elements from aqueous solutions by electrolysis. 4,190,508, Cl. 204-151.000.

Kanayama, Kaoru: *See*—
Samejima, Hiroshi; and Kanayama, Kaoru, 4,190,719, Cl. 528-103.000.

Kanazawa, Hiroyuki; and Futagami, Mikio, to Sumitomo Chemical Company, Limited; and Nippon Sheet Glass Co., Ltd. Method for the improvement of surface hardness of article by coating. 4,190,699, Cl. 428-412.000.

Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of evaluating the corrosion rate of metal. 4,190,502, Cl. 204-1.00T.

Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, to Kobe Steel, Ltd. Welding apparatus with shifting magnetic field. 4,190,760, Cl. 219-128.000.
Kansai Paint Company, Limited: *See*—
Tominaga, Akira; and Hirata, Yasuyuki, 4,190,564, Cl. 260-18.0PT.
Kantlehner, Jerry R.: *See*—
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., 4,190,690, Cl. 428-35.000.
Kao Soap Co., Ltd.: *See*—
Imamura, Tetsuya; and Hiraide, Takashi, 4,190,549, Cl. 252-91.000.
Murata, Moriyasu; and Sai, Fumio, 4,190,551, Cl. 252-99.000.
Ohmura, Hidemasa; and Saito, Masahiro, 4,190,567, Cl. 260-29.2TN.
Kaplan, Leonard, to Union Carbide Corporation. Catalytic process for production of polyhydric alcohols in presence of ammonium carboxylates. 4,190,598, Cl. 260-449.00L.
Kaplan, Roy I., to Nalco Chemical Company. Method of removing iron oxide deposits from heat transfer surfaces. 4,190,463, Cl. 134-3.000.
Kashiwara, Hirofumi: *See*—
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,190,789, Cl. 315-169.400.
Katayama, Shinji; and Murakami, Kazuo, to Nippon Gakki Seizo Kabushiki Kaisha. Pickup unit and pickup assembly for musical instrument. 4,189,969, Cl. 84-1.140.
Kato, Noboru. Dish carrying system. 4,190,134, Cl. 186-1.00R.
Kato, Takashi: *See*—
Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, 4,190,687, Cl. 427-389.000.
Kaufman, John J.; and Luisi, Thomas E., to Witco Chemical Corporation. Cable filler. 4,190,570, Cl. 260-33.6PQ.
Kaufman, Joseph R. Oil splatter screen for a deep fat fryer. 4,189,993, Cl. 99-403.000.
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, to Fujitsu Limited. Driving system for a self-shift type gas discharge panel. 4,190,789, Cl. 315-169.400.
Kawaharada, Minoru: *See*—
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, 4,190,887, Cl. 364-472.000.
Kawamura, Tateo: *See*—
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; and Nishimura, Michio, 4,190,023, Cl. 123-41.720.
Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, 4,190,137, Cl. 191-27.000.
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, to Toyo Soda Manufacturing Co., Ltd. Electrolysis of alkali metal chloride. 4,190,506, Cl. 204-98.000.
Kawasaki Steel Corporation: *See*—
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,190,469, Cl. 148-113.000.
Kayser, John P., to Airco, Inc. Double valve construction. 4,190,075, Cl. 137-329.100.
Kearney, Dolores C.; and Matz, Bruno, to Ford Motor Company. Vibration welding of expanded bead polystyrene. 4,190,093, Cl. 164-34.000.
Keeler Corporation: *See*—
Flowerday, Dale L., 4,189,804, Cl. 16-126.000.
Keigley, Ronald E. Hydraulic hand tool. 4,189,966, Cl. 83-178.000.
Keller, Nancy: *See*—
Gale, Robert M.; Ben-Dor, Monique; and Keller, Nancy, 4,190,642, Cl. 424-19.000.
Kelly, Jack R., Jr.; and Robinson, Glen P., Jr., to Scientific-Atlanta, Inc. Electrical load management system. 4,190,800, Cl. 325-37.000.
Kelly, Lawrence F. M.: *See*—
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,190,616, Cl. 260-945.000.
Kelly, Thomas R.: *See*—
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.
Kelsey-Hayes Co.: *See*—
Evans, James L.; and Main, John A., 4,190,092, Cl. 152-381.100.
Kemp, James A., to R A Electronics, Inc. Radiation detector. 4,190,838, Cl. 343-18.00E.
Kennedy, Charles R., to United States of America, Energy. Graphite having improved thermal stress resistance and method of preparation. 4,190,637, Cl. 423-448.000.
Kent Air Tool Company: *See*—
Gunning, Samuel D., 4,189,917, Cl. 60-370.000.
Ketzer, Mandred: *See*—
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.
Keul, Robert: *See*—
Fischer, Klaus; and Keul, Robert, 4,190,452, Cl. 106-52.000.
Kewanee Industries, Inc.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,190,644, Cl. 424-70.000.
Keystone International, Inc.: *See*—
Killian, Henry R., 4,189,950, Cl. 74-424.80A.
Kiedrowski, James A.: *See*—
Buckley, Charles G.; and Kiedrowski, James A., 4,189,948, Cl. 74-5.460.
Kiehs, Karl; Schrepfer, Hans J.; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Phosphonyl vinyl phosphorus compounds as pesticides. 4,190,650, Cl. 424-204.000.
Kikuchi, Yushichi: *See*—
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, 4,190,771, Cl. 250-385.000.
Kilar, Joseph H., to Motorola, Inc. Slide switch actuating apparatus. 4,190,754, Cl. 200-329.000.
Killian, Henry R., to Keystone International, Inc. Manual control apparatus. 4,189,950, Cl. 74-424.80A.
Kimball International, Inc.: *See*—
Doane, Patrick K., 4,189,973, Cl. 84-1.270.
Kimberly-Clark Corporation: *See*—
Krueger, Gary A., 4,190,241, Cl. 270-47.000.
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, to Hitachi, Ltd. Dynamic drive circuit for light-emitting diodes. 4,190,836, Cl. 340-762.000.
Kimura, Koya; Machi, Shinji; and Manabe, Takao, to Toshiba Kikai Kabushiki Kaisha. Programming apparatus of automatic sewing machines. 4,190,007, Cl. 112-121.120.
Kimwood Corporation: *See*—
Evans, F. David, 4,189,872, Cl. 51-135.00R.
Kinda, Frank L.: *See*—
Wells, Richard E.; and Kinda, Frank L., 4,190,167, Cl. 211-184.000.
Kindig, Cleon V., to Atari, Inc. Multiple drop target assembly for amusement game. 4,190,252, Cl. 273-127.00R.
Kinjo, Hisao, to Victor Company of Japan, Ltd. Tracking control apparatus for use in apparatus for reproducing video signals from a rotary recording medium. 4,190,859, Cl. 358-128.500.
Kira, Takehiro, to Ushio Denki Kabushikikaisha. Discharge lamp. 4,190,786, Cl. 313-184.000.
Kirchen, Michel: *See*—
Mailliet, Pierre; and Kirchen, Michel, 4,190,074, Cl. 137-315.000.
Kirchmayr, Rudolf: *See*—
Brunisholz, Jean; and Kirchmayr, Rudolf, 4,190,602, Cl. 260-590.00D.
Kirkby, Paul A.: *See*—
Goodman, Colin H. L.; and Kirkby, Paul A., 4,190,809, Cl. 331-94.50H.
Kishi, Toyokazu: *See*—
Hashimoto, Naoto; and Kishi, Toyokazu, 4,190,580, Cl. 260-239.30P.
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, to Futaba Denshi Kogyo Kabushiki Kaisha. Phosphorus luminescent display tube. 4,190,787, Cl. 313-494.000.
Kitamura, Kiyoyuki: *See*—
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.
Kitayama, Minoru; and Nakamura, Motoharu, to Nippon Steel Corporation. Process for coating an electrical steel sheet with an anti-sticking layer. 4,190,468, Cl. 148-12.00A.
Kittler, Helmut, to GIF Gesellschaft fur Ingenieurprojekte Freiburg mbH. False ceiling. 4,189,990, Cl. 98-121.00R.
Klein, Albert J.; Chen, Chiou-Tse; and Kohl, Lou, to American Can Company. Process for fabricating steel from ferrous metal particles. 4,190,440, Cl. 75-211.000.
Klein, William R.: *See*—
Luce, Dan G.; Klein, William R.; and Krenke, Richard D., 4,190,777, Cl. 307-139.000.
Kleinjans, Peter A. M.: *See*—
Bijen, Jan M. J. M.; and Kleinjans, Peter A. M., 4,190,455, Cl. 106-98.000.
Klokkers, Frits H., to U.S. Philips Corporation. Protective device for an electron tube. 4,190,873, Cl. 361-56.000.
Klope, Lawrence R., to Deere & Company. Fluid control system. 4,190,298, Cl. 303-2.000.
Kluczynski, Achim; and Tabel, Johannes, to AGFA-Gevaert, A.G. Narrow gauge film cassette. 4,190,216, Cl. 242-194.000.
Knapp, Kenneth K., to Eaton Corporation. Hydraulic controller. 4,189,921, Cl. 60-445.000.
Knapp, Paul A. Photographic easel apparatus. 4,190,356, Cl. 355-74.000.
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., to Goodyear Aerospace Corporation. Wave-compliant, bottom tension boom. 4,190,381, Cl. 405-72.000.
Knight, J. Nelson; and Turner, Roger C., to General Electric Company. Structural support for a refrigerator. 4,190,305, Cl. 312-214.000.
Knight, James A.: *See*—
Wade, Thomas B.; and Knight, James A., 4,190,541, Cl. 210-241.000.
Knight, Jerry W.; and Woodward, Mervyn, to Westinghouse Electric Corp. Profile milling machine. 4,190,389, Cl. 409-120.000.
Knight, Philip A., Jr.: *See*—
Bowen, Robert F.; and Knight, Philip A., Jr., 4,190,077, Cl. 137-550.000.
Knowlton, Kenneth C., to Bell Telephone Laboratories, Incorporated. Circuits having substantially parabolic output versus linear input characteristics. 4,190,896, Cl. 364-859.000.
Knuchel, Max, to SIG-Schweizerische Industrie-Gesellschaft. Apparatus for conveying fragile items. 4,190,146, Cl. 198-460.000.
Knutti, David F.: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., to United States of America, Energy. Energy-efficient regenerative liquid desiccant drying process. 4,189,848, Cl. 34-32.000.

Kobe Steel, Ltd.: *See*—
Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, 4,190,760, Cl. 219-128.000.
Kodama, Kunio: *See*—
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.
Koenig & Bauer Aktiengesellschaft: *See*—
Bolza-Schunemann, Hans B., 4,190,242, Cl. 270-50.000.
Michalik, Horst B.; and Weschenfelder, Otto T., 4,190,243, Cl. 270-66.000.
Kohl, Lou: *See*—
Klein, Albert J.; Chen, Chiou-Tse; and Kohl, Lou, 4,190,440, Cl. 75-211.000.
Kohno, Mitsuo: *See*—
Doi, Yoshinao; Kohno, Mitsuo; and Yoshitake, Katsumi, 4,190,707, Cl. 429-254.000.
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, to Daiichi Radioisotope Laboratories, Ltd. Cortisol radioimmunoassay method and cortisol derivatives useful therefor. 4,190,593, Cl. 260-397.450.
Kojima, Takahide: *See*—
Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, 4,190,516, Cl. 204-290.00R.
Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., to Scott Paper Company. Liquid impregnating system. 4,189,896, Cl. 53-431.000.
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., to Synthelabo. Naphthyridine derivatives. 4,190,657, Cl. 424-256.000.
Kollann, Rolf. Revolving cross cutter. 4,189,965, Cl. 83-155.000.
Komatsubara, Michiro: *See*—
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,190,469, Cl. 148-113.000.
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Method for cleaning a photoconductive surface with liquid toner. 4,190,464, Cl. 134-6.000.
Kompanek, Harry W., to Essex Transducers Corporation. Pressure sensitive signal generator using piezoelectric coating. 4,190,785, Cl. 310-330.000.
Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha. Electronic watch with alarm mechanism. 4,189,910, Cl. 58-38.00R.
Koninklijke Scholten-Honig N.V.: *See*—
Niemeijer, Klaas B., 4,190,523, Cl. 209-211.000.
Konkle, Phillip E.; and Tinholt, Thomas H., to Eaton Corporation. Fluid coupling device, bimetal clip and method of assembly therefor. 4,190,140, Cl. 192-82.00T.
Konkle, Phillip E.: *See*—
Tinholt, Thomas H.; and Konkle, Phillip E., 4,190,139, Cl. 192-58.00B.
Korger, Heinz, to Carl Stahl GmbH & Co. KG. Back-holding device for auxiliary seats, particularly children's seats, to be placed on conventional vehicle seats. 4,190,288, Cl. 297-488.000.
Korger, Heinz K., to Carl Stahl GmbH & Co. KG, Gurt -und Bandweberei. Adjustable headrest assembly for automotive vehicles. 4,190,291, Cl. 297-408.000.
Korsakov-Bogatkov, Sergei M.: *See*—
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.
Kosakowski, Henry R., to Bendix Corporation, The. System having a fixed excitation and providing a variable ratio output. 4,190,891, Cl. 364-606.000.
Kostiner, Edward. Photographic enlarging easel. 4,190,357, Cl. 355-74.000.
Kozhevnikov, Nikolai I.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, to Rohm Gmbh. Pearl polymer containing hollow pearls. 4,190,713, Cl. 521-149.000.
Kraess, Henri: *See*—
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.
Krafka, Jerry L.: *See*—
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.
Krakovsky, Boris D.: *See*—
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.
Kramer, Marvin, to Alenite Corporation, The. Trophy plaque. 4,190,691, Cl. 428-67.000.
Krantz, Karl W., to General Electric Company. Process for transmitting a hydrocarbon fluid through a pipeline. 4,190,069, Cl. 137-13.000.
Krause, Gerhard, to Siemens Aktiengesellschaft. A.C. supplied integrated semi-conductor logic circuit. 4,190,778, Cl. 307-254.000.
Krauss, Gerhard: *See*—
Schenke, Walter; and Krauss, Gerhard, 4,189,788, Cl. 2-209.000.
Krenke, Richard D.: *See*—
Luce, Dan G.; Klein, William R.; and Krenke, Richard D., 4,190,777, Cl. 307-139.000.
Krenzer, John, to Velsicol Chemical Corporation. Substituted oxadiazolidine-3,5-diones. 4,190,431, Cl. 71-92.000.
Krimm, David L.: *See*—
Martin, James O.; Fathergill, Rex D.; and Krimm, David L., 4,189,974, Cl. 84-293.000.
Kristensen, Erling B.: *See*—
Tankred, Hans J.; and Kristensen, Erling B., 4,189,984, Cl. 92-82.000.
Kroker, Ruprecht; Sander, Hans; and Gausepohl, Hermann, to BASF Aktiengesellschaft. Baking finishes of low solvent content. 4,190,569, Cl. 260-31.600.
Kroll, Rudolf: *See*—
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,190,038, Cl. 126-445.000.
Krueger, Gary A., to Kimberly-Clark Corporation. Apparatus for converting paper rolls into stacks of individual folded paper sheets. 4,190,241, Cl. 270-47.000.
Krupp-Koppers GmbH: *See*—
Lagemann, Gunther; and Heisterkamp, Wilhelm, 4,190,497, Cl. 202-150.000.
Kubiatowicz, James F., to Custom Concepts Incorporated. Toy timing device. 4,189,911, Cl. 58-106.000.
Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Method and apparatus for insertion of weft threads in jet weaving machines. 4,190,067, Cl. 139-435.000.
Kudamatsu, Akio: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.
Kuhn, Charles J. Pulling apparatus. 4,189,934, Cl. 72-447.000.
Kuhr, Albert F., to United States Gypsum Company. Ceiling runner and panel assembly having sliding lockability. 4,189,893, Cl. 52-779.000.
Kulesha, Vadim A.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Kulik, Stanley; and Smith, Anthony M., to British Petroleum Company Limited, The. Traction fluid. 4,190,546, Cl. 252-49.600.
Kulle, Lee K.; and Rudzena, William L., to Baxter Travenol Laboratories, Inc. Closure with compensating threads. 4,190,171, Cl. 215-329.000.
Kulpa, Walter J., to Remington Products, Inc. Exothermic hair curler. 4,190,065, Cl. 132-33.00R.
Kume, Toyohiko: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.
Kunishima, Mamoru: *See*—
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.
Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, to Monsanto Company. Production of urokinase. 4,190,708, Cl. 435-215.000.
Kuppersbusch Aktiengesellschaft: *See*—
Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, 4,189,995, Cl. 99-447.000.
Kuramoto, Nobuyuki: *See*—
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.
Kuraray Co., Ltd.: *See*—
Fujimoto, Yoshiaki, 4,190,411, Cl. 425-434.000.
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, 4,190,572, Cl. 264-46.400.
Kuroiwa, Hiroyuki: *See*—
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.
Kurumatani, Masaaki: *See*—
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.
Kuwik, John J.: *See*—
Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John, 4,190,773, Cl. 250-445.00T.
Kwater, James L., to Weed Eater, Inc. Apparatus for cutting vegetation. 4,189,833, Cl. 30-276.000.
Kyle, Nanse R., to Hughes Aircraft Company. Method for obtaining optically clear, high resistivity II-VI, III-V, and IV-VI compounds by heat treatment. 4,190,486, Cl. 156-601.000.
Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, 4,190,651, Cl. 424-209.000.
L. B. (Plastics) Limited: *See*—
Litchfield, Leon G.; and Hardy, Terence, 4,190,306, Cl. 312-330.00R.
Laa, Friedrich: *See*—
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.

Laanio, Verena; Fory, Werner; and Schurter, Rolf, to Ciba-Geigy Corporation. Thioester of 1,2-diphenyl-cyclohex-1-ene-4-carboxylic-acid. 4,190,433, Cl. 71-100.000.
Laboratoires Chauvin-Blache: *See*—
Dong, P. Le Hao; and Coquelet, Claude, 4,190,661, Cl. 424-258.000.
Labriola, Daniel J. Hand held pocket size ski repair and maintenance tool. 4,189,874, Cl. 51-181.00R.
Lacefield, William B., to Eli Lilly and Company. 5,6-Diaryl-1,2,4-triazines. 4,190,725, Cl. 544-182.000.
Lachonius, Leif; and Becker, Dieter, to Aktiebolaget SKF. Axial bearing for a roller drill bit. 4,190,301, Cl. 308-8.200.
LaCoste, Bernard L., to Westinghouse Electric Corp. Ocean thermal energy conversion system and method for operation. 4,189,924, Cl. 60-641.000.
Lagemann, Gunther; and Heisterkamp, Wilhelm, to Krupp-Koppers GmbH. Apparatus for heating up a chamber of a coking battery. 4,190,497, Cl. 202-150.000.
Lai, John T.; and Son, Pyong N., to B. F. Goodrich Company, The. Substituted 2-keto-1,4-diazacycloalkanes and UV-light-stabilized compositions containing them. 4,190,571, Cl. 260-45.80N.
Laing, Robert, to Curtis & Marble Machine Company. Method of and apparatus for wrapping products. 4,189,894, Cl. 53-399.000.
Lainiere de Picardie: *See*—
Groshens, Pierre, 4,189,931, Cl. 66-193.000.
Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, to Titeflex Corporation. Chafe or fire sleeve for hose. 4,190,088, Cl. 138-126.000.
Lama, William L.: *See*—
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.
Lambert Anodizing Co. Inc.: *See*—
Lambert, Raymond E., 4,190,333, Cl. 351-95.000.
Lambert, Raymond E., to Lambert Anodizing Co. Inc. Spectacle frames. 4,190,333, Cl. 351-95.000.
Landauer, Franz, to Hoechst Aktiengesellschaft. Process for the manufacture of m-halobenzoyl halides. 4,190,600, Cl. 260-544.00D.
Landes, Wilhelm: *See*—
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.
Landis, Norris J., to Standard Oil Company (Ohio). Process for prilling urea. 4,190,622, Cl. 264-14.000.
Landow Consulting Associates, Inc.: *See*—
Landow, Herbert T., 4,190,393, Cl. 414-333.000.
Landow, Herbert T., to Landow Consulting Associates, Inc. Wheeled vehicle car loading and unloading system and method therefor. 4,190,393, Cl. 414-333.000.
Lang, Armin; and Fassbender, Rolf, to Zahnradfabrik Friedrichshafen AG. Feed pressure bypass valving for servomotors. 4,189,982, Cl. 91-400.000.
Lang, Armin: *See*—
Fassbender, Rolf; and Lang, Armin, 4,189,983, Cl. 91-400.000.
Langenbusch, Hans J.: *See*—
Zucker, Friedrich J.; and Langenbusch, Hans J., 4,190,373, Cl. 366-160.000.
Langford, Gordon B., to Rogers Corporation. Keyboard switch assembly. 4,190,748, Cl. 200-5.00A.
Lanman Lithotech, Inc.: *See*—
Cunningham, Bruce B.; and Barfield, Charles R., Jr., 4,190,360, Cl. 355-89.000.
Lansbergen, Simon G. Bath sponge having incorporated therein a core of detergent substances, and method and apparatus for manufacturing same. 4,189,802, Cl. 15-104.930.
Lanusse, Marie M. Fluid product projection apparatus for maintenance and treatment of all surfaces as well as the body. 4,189,801, Cl. 15-29.000.
Larbig, Wolfgang, to Bayer Aktiengesellschaft. Process for the electrophoretic breaking of emulsions. 4,190,510, Cl. 204-180.00R.
Larsen, Max J., to Du Pont de Nemours, E. I., and Company. Centrifuge tube cap. 4,190,196, Cl. 233-26.000.
Larsen, Ronald L., to Conwed Corporation. High strand count plastic net. 4,190,692, Cl. 428-107.000.
LaRue, Mervin W., Jr., to Bell & Howell Company. Optical system for rotary camera. 4,190,353, Cl. 355-24.000.
Laser Precision Corporation: *See*—
Doyle, Walter M., 4,190,366, Cl. 356-346.000.
Lavoisey, Yves, to Saint-Gobain Industries. Apparatus and method for the assembly of glass sheets. 4,189,818, Cl. 29-281.500.
Lawrence, Jackson; and Webb, Harry A., to Cluett, Peabody & Co., Inc. Process and apparatus for removal of ammonia in a liquid ammonia fabric treating system. 4,189,847, Cl. 34-19.000.
Leach, Gale L.: *See*—
Bahl, Surinder K.; and Leach, Gale L., 4,190,489, Cl. 156-664.000.
LeBlanc, Edgar J.: *See*—
LeBlanc, Gerald J.; and LeBlanc, Edgar J., 4,190,224, Cl. 248-229.000.
LeBlanc, Gerald J.; and LeBlanc, Edgar J. Intravenous pole holder. 4,190,224, Cl. 248-229.000.
LeBron, Roderick R., III. Drop shelf vending mechanism. 4,190,178, Cl. 221-90.000.
Lecklider, Thomas H.; and Bowers, John J., to Gould Inc. Capacitive gauging system utilizing a low internal capacitance, high impedance amplifier means. 4,190,797, Cl. 324-61.00R.
Le Devehat, Eugene R., to FMC Corporation. Articulated loading arm control system. 4,190,080, Cl. 137-615.000.
Lee, David Q.: *See*—
Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., 4,190,745, Cl. 179-18.0AH.
Lee, James K.: *See*—
Frank, Lee F.; and Lee, James K., 4,190,336, Cl. 354-50.000.
Leeds, Winthrop M. "Double-chess" game board. 4,190,254, Cl. 273-261.000.
LeFevre, Jean P. G.: *See*—
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.
Lehmann, Hans D.: *See*—
Schmidhuber, Karl; and Lehmann, Hans D., 4,190,284, Cl. 297-194.000.
Leichle, Claude, to Regie Nationale des Usines Renault. Interface unit for use between analog sensors and a microprocessor. 4,190,823, Cl. 340-347.0NT.
Leitten, Arthur H., Jr.: *See*—
DePuy, Robert P.; and Leitten, Arthur H., Jr., 4,190,825, Cl. 340-347.0AD.
Lemisch, Ellen; and Rostock, Fredrik. Knee abductor and restrainer. 4,190,287, Cl. 297-466.000.
Lennox Industries Inc.: *See*—
Cawley, Richard E.; and Buckley, Paul K., 4,190,199, Cl. 126-419.000.
Leszczynska, Halina; and Leszczynski, Jerzy, to Instytut Przemysku Organicznega. Method of prilled sulphur storage in the open area. 4,190,627, Cl. 422-40.000.
Leszczynski, Jerzy: *See*—
Leszczynska, Halina; and Leszczynski, Jerzy, 4,190,627, Cl. 422-40.000.
Letournoux, Alain; and Droual, Rene, to Societe Industrielle Bertrand Faure. Vehicle seat slides. 4,190,226, Cl. 248-429.000.
Lever Brothers Company, Inc.: *See*—
Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., 4,190,563, Cl. 260-17.4GC.
Levine, Robert A.; Massey, James V., III; and Wardlaw, Stephen C. Process for detection of blood-borne parasites. 4,190,328, Cl. 350-320.000.
Levine, Stephen N., to Motorola, Inc. Digital demodulator for phase shift keyed signals. 4,190,802, Cl. 325-320.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,190,432, Cl. 71-93.000.
Lewer, Hans: *See*—
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.
Lewis, Norlin O.: *See*—
Loftis, James B.; and Lewis, Norlin O., 4,190,119, Cl. 173-149.000.
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, to Bayer Aktiengesellschaft. Blowing agents based on urea dicarboxylic acid anhydride. 4,190,710, Cl. 521-89.000.
Liautaud, James P., to American Antenna Corporation. Mobile antenna including quick-release mounting. 4,190,839, Cl. 343-715.000.
Liautaud, James P., to American Antenna Corporation. Antenna mounting adaptor. 4,190,840, Cl. 343-715.000.
Libbey-Owens-Ford Company: *See*—
Oelke, Waldemar W.; and Poplawsky, Ralph C., 4,190,184, Cl. 225-2.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.
Wermuth, Jurgen, 4,190,806, Cl. 330-51.000.
Lieber, Derek: *See*—
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.
Lien, Suei-Yuen P., to Western Electric Co., Inc. Semiconductor device production. 4,190,467, Cl. 148-1.500.
Liljequist, Jon L.: *See*—
Appleton, Arthur I.; Liljequist, Jon L.; and Ylagan, Carlos J., 4,190,222, Cl. 248-56.000.
Lin, Henry C., to Hooker Chemicals & Plastics Corp. Process for the directed chlorination of xylenes. 4,190,609, Cl. 260-650.00R.
Lin, Wen: *See*—
Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, 4,190,631, Cl. 422-249.000.
Lindell, Albert H.: *See*—
Dillon, Glenn W.; and Lindell, Albert H., 4,189,824, Cl. 29-522.00R.
Lindell, Stig. Loose-leaf binder. 4,190,374, Cl. 402-3.000.
Lindner, Herbert E.: *See*—
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.
Lindstrom, Rune H.: *See*—
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.
Ling, Andrew T.: *See*—
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.
Lipha, Lyonnaise Industrielle Pharmaceutique: *See*—
Szarvasi, Etienne; and Festal, Didier, 4,190,665, Cl. 424-274.000.
Lipshutz, Bruce H.: *See*—
Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., 4,190,579, Cl. 260-239.00A.

Lipton, Thomas J.: *See*—
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.

Litchfield, Leon G.; and Hardy, Terence, to L. B. (Plastics) Limited. Drawer with stop device. 4,190,306, Cl. 312-330.00R.

Litehizer, Melvin P., Jr., to AMP Incorporated. Cable stripping tool. 4,189,799, Cl. 7-107.000.

Litichevsky, Marx I.: *See*—
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., 4,190,630, Cl. 422-249.000.

Litton Industrial Products Inc.: *See*—
Marinkovich, Cedomir S.; and Crimmins, William M., 4,190,774, Cl. 250-446.000.

Liu, Chao Kai: *See*—
Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., 4,190,747, Cl. 179-170.0NC.

Ljung, Bo H. G.; and Gamertsfelder, George R., to Singer Company, The. Ring laser gyroscope. 4,190,364, Cl. 356-350.000.

Lochridge, Joe C.: *See*—
Schmitz, Thomas R.; Srivastav, Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., 4,190,382, Cl. 405-159.000.

Locke, Frederic J.: *See*—
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.

Locke, Werner: *See*—
Schutze, Siegfried; and Locke, Werner, 4,190,337, Cl. 354-60.00L.

Lockhart Industries, Inc.: *See*—
Casuga, Dennis W.; and Hauser, William C., 4,190,198, Cl. 236-34.500.

Lockheed Corporation: *See*—
Hackett, James E., 4,190,219, Cl. 244-199.000.

Loepfe, Erich, to Aktiengesellschaft Gebruder Loepfe. Method and device for measuring the variations of the cross-sectional dimensions of a moving thread-like structure. 4,189,841, Cl. 33-147.00L.

Loesch, Stanley B., to Halliburton Company. Vane straightener retainer. 4,189,941, Cl. 73-231.00R.

Loftis, James B.; and Lewis, Norlin O., to Joy Manufacturing Company. Earth drilling apparatus. 4,190,119, Cl. 173-149.000.

Logan, Ralph A.; and Tsang, Won-Tien, to Bell Telephone Laboratories, Incorporated. Strip buried heterostructure laser. 4,190,813, Cl. 331-94.50H.

Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, to Kuppersbusch Aktiengesellschaft. Apparatus for heating food. 4,189,995, Cl. 99-447.000.

Long, E. David, to Allied Chemical Corporation. Fuel injection system with correction for incidental system variables. 4,190,022, Cl. 123-32.0EF.

Long, George, to Northern Illinois Gas Company. Method of storing electric power. 4,189,925, Cl. 60-652.000.

Lonza Ltd.: *See*—
Tenud, Leander, 4,190,585, Cl. 260-326.13R.

Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, to Carl Hurth Maschinen-und Zahnradfabrik. Apparatus and tool for precision working, particularly shaving, of gears. 4,190,387, Cl. 409-33.000.

Lopez, Ana. String top. 4,189,862, Cl. 46-63.000.

Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., to GAF Corporation. Process for increasing molecular weight of vinylpyrrolidone polymer. 4,190,718, Cl. 526-207.000.

Louis, Remi: *See*—
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.

Lucas, George A.: *See*—
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.

Luce, Betty M.: *See*—
Berdan, Betty L.; and Luce, Betty M., 4,190,474, Cl. 156-151.000.

Luce, Dan G.; Klein, William R.; and Krenke, Richard D., to Tideland Signal Corporation. Position sensor for rotatable lamp changer turret. 4,190,777, Cl. 307-139.000.

Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., to Corning Glass Works. Means for separating lymphocytes and monocytes from anticoagulated blood. 4,190,535, Cl. 210-83.000.

Ludwig, George C., to Tom McGuane Industries, Inc. Combination throttle kicker and deceleration valve. 4,189,981, Cl. 91-52.000.

Luisi, Thomas E.: *See*—
Kaufman, John J.; and Luisi, Thomas E., 4,190,570, Cl. 260-33.6PQ.

Luknar, Amiel. Surveillance device incorporating a television camera. 4,190,866, Cl. 358-229.000.

Lummus Company, The: *See*—
Tsao, Utah, 4,190,639, Cl. 423-491.000.

Lundstrom, Per-Ake: *See*—
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.

Lux, Peter, to U.S. Philips Corporation. Method and arrangement for redundancy-reducing picture coding. 4,190,861, Cl. 358-135.000.

Lybbert, Evart K. Concrete discharge chutes. 4,190,144, Cl. 193-10.000.

Lynn, William F.; and Walker, Gordon M., to Boeing Commercial Airplane Company. Sealed lined bearings. 4,190,302, Cl. 308-36.100.

Lyons, James E.; Myers, Harry K., Jr.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Catalytic codimerization of norbornadiene with norbornene. 4,190,611, Cl. 585-361.000.

Lyons, James E.: *See*—
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,190,610, Cl. 585-361.000.

M/A COM, Inc.: *See*—
Walline, Robert E., 4,190,470, Cl. 148-175.000.

Macaluso, Paul J.; and Clifford, Lawrence E., to Pitney-Bowes, Inc. Copying machine with electromechanical scavenger assembly and process. 4,190,351, Cl. 355-15.000.

Machi, Shinji: *See*—
Kimura, Koya; Machi, Shinji; and Manabe, Takao, 4,190,007, Cl. 112-121.120.

Machida Endoscope Co., Ltd.: *See*—
Chikama, Toshio, 4,190,041, Cl. 128-4.000.

Machida, Masamichi: *See*—
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.

Machine Technology, Inc.: *See*—
Hillman, Gary, 4,190,015, Cl. 118-696.000.

MacIntosh, James L.: *See*—
Flowers, Leonard J.; Fahnestock, Melvin R.; and MacIntosh, James L., 4,190,186, Cl. 228-15.100.

MacLean, Donald R. Support and positioner for rock drill. 4,190,117, Cl. 173-43.000.

MacMillan, Kenneth T., to Donald MacMillan & Son, Inc. Heating device for a tire retreading mold. 4,190,405, Cl. 425-20.000.

Madan, Bhim S.: *See*—
Schaeffer, Robert L.; and Madan, Bhim S., 4,190,208, Cl. 241-92.000.

Maddison, Vicki: *See*—
Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., 4,190,563, Cl. 260-17.4GC.

Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, to BASF Aktiengesellschaft. Non-flammable insulating material. 4,190,547, Cl. 252-62.000.

Mai, Erich: *See*—
Wenzel, Joerg; and Mai, Erich, 4,190,135, Cl. 187-1.00R.

Maida, Osamu, to Nippon Kogaku K.K. Motor drive apparatus for photographic camera. 4,190,340, Cl. 354-173.000.

Maile, Graham K.: *See*—
Vanstone, Anthony E.; and Maile, Graham K., 4,190,671, Cl. 424-317.000.

Mailliet, Pierre; and Kirchen, Michel, to Paul Wurth, S.A. Pressure equalization valve and technique for shaft furnace. 4,190,074, Cl. 137-315.000.

Main, John A.: *See*—
Evans, James L.; and Main, John A., 4,190,092, Cl. 152-381.100.

Maitani, Yoshihisa, to Olympus Optical Company, Ltd. Shutter controlling aid means for use with camera. 4,190,335, Cl. 354-34.000.

Makino, Yoshimi: *See*—
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.

Makita, Satoru: *See*—
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, 4,190,787, Cl. 313-494.000.

Makuch, John A., to Bunker Ramo Corporation. Fiber optic cable connector pin assembly. 4,190,317, Cl. 350-96.200.

Malinich, Richard M.: *See*—
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.

Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., to Deutsch Company, The. Lens connector for optical fibers. 4,190,316, Cl. 350-96.180.

Manabe, Takao: *See*—
Kimura, Koya; Machi, Shinji; and Manabe, Takao, 4,190,007, Cl. 112-121.120.

Mantani, Rokurota, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument system having independent tone cabinet. 4,189,971, Cl. 84-1.240.

Manuel, John L. Universal orthodontic pliers. 4,189,839, Cl. 433-4.000.

Manuel, Ronald J.: *See*—
Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., 4,190,633, Cl. 423-321.00S.

Marcus, Erich: *See*—
Decker, Quintin W.; and Marcus, Erich, 4,190,601, Cl. 260-583.00R.

Marek, Cecil J.; and Cooper, Larry P., to United States of America, National Aeronautics and Space Administration. Supercritical fuel injection system. 4,189,914, Cl. 60-726.000.

Mares, Frank: *See*—
Diamond, Steven E.; and Mares, Frank, 4,190,595, Cl. 260-429.00R.

Marinkovich, Cedomir S.; and Crimmins, William M., to Litton Industrial Products Inc. Radiographic table system. 4,190,774, Cl. 250-446.000.

Mark Controls Corporation: *See*—
Hoyt, Jerry L., 4,190,159, Cl. 206-524.000.

Mark, Harold W.: *See*—
Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., 4,190,552, Cl. 252-411.00R.

Markusch, Peter: *See*—
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, 4,190,459, Cl. 106-287.250.

Marquip, Inc.: *See*—
Marschke, Carl R., 4,190,475, Cl. 156-157.000.

Marschke, Carl R., to Marquip, Inc. Paper roll web splicing. 4,190,475, Cl. 156-157.000.

Marshall, Robert M.; and Dardoufas, Kimon C., to Allied Chemical Corporation. Application of fluorocarbon compound to synthetic organic polymer yarn. 4,190,545, Cl. 252-8.750.

Martin, James O.; Fathergill, Rex D.; and Krimm, David L. Guitar neck assembly. 4,189,974, Cl. 84-293.000.

Martin, Niles J.: *See*—
Bains, Gurdip S.; and Martin, Niles J., 4,189,890, Cl. 52-584.000.

Martin, Thomas W.; Sandhu, Mohammad A.; and Savage, Dennis J., to Eastman Kodak Company. Photocrosslinkable, high-temperature-resistant polymers and their use in color imaging devices. 4,190,446, Cl. 430-25.000.

Martorano, Richard; and Brendley, William H., to Rohm and Haas Company. Coating method using compositions comprising acrylic oligomers, high polymers and crosslinkers. 4,190,693, Cl. 428-209.000.

Marum, Steven E., to Texas Instruments Incorporated. Integrated injection logic electronic system with voltage regulator for multiplexed liquid crystal display. 4,189,909, Cl. 58-23.00R.

Marx, Arthur F.; and Doodewaard, Jean, to Gist Brocades N.V. Prostaglandin derivatives. 4,190,670, Cl. 424-305.000.

Marx, Warren G., to Grumman Aerospace Corporation. Programmable light director system. 4,190,890, Cl. 364-491.000.

Mary, Dominique. Air cushion bumper cars. 4,190,129, Cl. 180-119.000.

Masilamani, Divakaran; and Rogic, Milorad M., to Allied Chemical Corporation. Regioselective isomerization at carbon atom vicinal to doubly bonded tertiary carbon atom by sulfur dioxide catalysis. 4,190,612, Cl. 585-378.000.

Mason, LeRoy W.; and Furrer, Frederick J., to Flambeau Products Corporation. Beverage container. 4,190,173, Cl. 220-203.000.

Massa, Frank, to Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The. Electroacoustic transducers of the bi-laminar flexural vibrating type with an acoustic delay line. 4,190,783, Cl. 310-324.000.

Massa, Frank, to Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The. Piezoelectric electroacoustic transducers of the bi-laminar flexural vibrating type. 4,190,784, Cl. 310-324.000.

Massachusetts General Hospital: *See*—
Seldin, Edward B., 4,189,835, Cl. 433-214.000.

Massey, James V., III: *See*—
Levine, Robert A.; Massey, James V., III; and Wardlaw, Stephen C., 4,190,328, Cl. 350-320.000.

Masson Scott Thrissell Engineering, Ltd.: *See*—
Calvert, Edward G., 4,189,967, Cl. 83-665.000.

Masters, Carson W., III. Shower shield. 4,189,790, Cl. 4-149.000.

Masuda, Yoshinori: *See*—
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.

Masumoto, Hiroki: *See*—
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.

Mathbirk Limited: *See*—
Matthews, Denis, 4,190,009, Cl. 112-262.100.

Matsuda, Akira: *See*—
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.

Matsuda, Chiaki, to Mazda Cartex Company, Limited. Random automatic selector. 4,190,164, Cl. 209-610.000.

Matsuda, Mutsuhide: *See*—
Okuno, Youichi; Yokota, Hideo; and Matsuda, Mutsuhide, 4,190,338, Cl. 354-106.000.

Matsui, Mikihiro: *See*—
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, 4,190,572, Cl. 264-46.400.

Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, to Takeda Chemical Industries, Ltd. Uracil derivatives and production thereof. 4,190,656, Cl. 424-251.000.

Matsuo, Takehiko: *See*—
Takahashi, Teruomi; and Matsuo, Takehiko, 4,190,445, Cl. 430-66.000.

Matsushita Electric Corp. of America: *See*—
Dorren, Louis, 4,190,737, Cl. 179-1.0GH.

Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, to Tokuyama Soda Kabushiki Kaisha. Electrolytic cell. 4,190,514, Cl. 204-242.000.

Matsuura, Shunji: *See*—
Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, 4,190,516, Cl. 204-290.00R.

Matthews, Denis, to Mathbirk Limited. Linking machines. 4,190,009, Cl. 112-262.100.

Matz, Bruno: *See*—
Kearney, Dolores C.; and Matz, Bruno, 4,190,093, Cl. 164-34.000.

Mauer, Dieter, to USM Corporation. Fastener. 4,189,978, Cl. 85-72.000.

Maurer, Fritz: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Maurer, Gernant E.: *See*—
Boesch, William J.; and Maurer, Gernant E., 4,190,437, Cl. 75-122.000.

May, Russell R.: *See*—
Hoekje, Howard H.; and May, Russell R., 4,190,638, Cl. 423-473.000.

Mayer & Wonisch Spezialfabrik fuer Mess- und Regelgeraete: *See*—
Wonisch, Franz, 4,190,034, Cl. 126-25.00B.

Mazda Cartex Company, Limited: *See*—
Matsuda, Chiaki, 4,190,164, Cl. 209-610.000.

Maze, Perry V. Gable ventilators. 4,189,989, Cl. 98-42.00R.

MCA Discovision, Inc.: *See*—
Somers, Frank J.; and Winslow, John S., 4,190,860, Cl. 358-128.500.

McAllister, James E.: *See*—
Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., 4,190,633, Cl. 423-321.00S.

McCarthy, Edward F., to Gillette Company, The. Steam facial apparatus. 4,190,052, Cl. 128-368.000.

McCord Corporation: *See*—
Flanagan, Kirby E. L., 4,190,712, Cl. 521-137.000.

McCord, Michael A.: *See*—
Moulds, Frank G.; and McCord, Michael A., 4,189,898, Cl. 53-446.000.

McCormick, Paul O.: *See*—
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., 4,189,848, Cl. 34-32.000.

McCoy, Clifford W.: *See*—
Cookson, Donald H.; and McCoy, Clifford W., 4,190,005, Cl. 110-347.000.

McDaniel, Max P., to Phillips Petroleum Co. Preparation of inorganic xerogels. 4,190,457, Cl. 106-122.000.

McDonough Power Equipment, Division of Fuqua Industries, Inc.: *See*—
Jackson, Harold P.; and Rhinehart, Richard W., 4,189,903, Cl. 56-255.000.

McGarrity, Richard P.: *See*—
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., 4,190,882, Cl. 363-26.000.

McKay, Dwight L.: *See*—
Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., 4,190,552, Cl. 252-411.00R.

McKibbin, John R.; and Tyler, Frederick B., Jr. Apparatus for guiding a tool in a linear path relative to a work piece, and method of manufacture thereof. 4,190,236, Cl. 266-69.000.

McKinnon, Alan A.: *See*—
Bosley, John A.; Maddison, Vicki; and McKinnon, Alan A., 4,190,563, Cl. 260-17.4GC.

McManamy, Thomas A.: *See*—
Allread, John J.; McManamy, Thomas A.; and Peter, Bruno E., 4,190,097, Cl. 164-343.000.

McManus, Ira J. Composite system for floor frame members. 4,189,883, Cl. 52-250.000.

McNab, Incorporated: *See*—
Diamond, Joseph M., 4,190,827, Cl. 340-500.000.

Mead Corporation, The: *See*—
Bahl, Surinder K.; and Leach, Gale L., 4,190,489, Cl. 156-664.000.
Oliff, James R.; and Watkins, Richard K., 4,190,149, Cl. 206-145.000.

Medici, Italo: *See*—
Warnant, Julien; Farcilli, Andre; and Medici, Italo, 4,190,658, Cl. 424-256.000.

Medina, Alvaro. Automatic digital water control system. 4,190,884, Cl. 364-104.000.

Meece, Meredith W.; Ickes, Charles W.; and Moore, Fred H., to International Telephone and Telegraph Corporation. Integrated high capacity compressor. 4,190,402, Cl. 417-415.000.

Mefina S.A.: *See*—
Baruffa, Olindo, 4,190,008, Cl. 112-158.00B.

Meier, Hanspeter: *See*—
Schnellmann, Ferdinand; and Meier, Hanspeter, 4,190,544, Cl. 210-461.000.

Meir, Robert A.: *See*—
Moody, George W.; and Meir, Robert A., 4,189,918, Cl. 60-398.000.

Meisenberg, Ralf, to O. Dorries GmbH. Process and apparatus for production of faced or laminated sheets. 4,190,478, Cl. 156-252.000.

Mellor, Leslie, to Edgar Pickering (Blackburn) Limited. Tufting machines. 4,190,006, Cl. 112-79.00R.

Mena, Andre: *See*—
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.

Meng, Ilse H. F., heiress: *See*—
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Meng, Karl-August, deceased: *See*—
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Menzel, Paul B. Litter and refuse receptacle and separator. 4,190,525, Cl. 209-235.000.

Mera, Yoichi: *See*—
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, 4,190,787, Cl. 313-494.000.

Merat, Jean-Pierre; and Wiel, Gaston. Apparatus for de-aerating and vacuuming packing with tight closing anti-pollution device. 4,189,899, Cl. 53-570.000.

Merck & Co., Inc.: *See*—
DeMarco, Joseph; and Brenner, Gerald S., 4,190,655, Cl. 424-250.000.
Veber, Daniel F., 4,190,648, Cl. 424-177.000.

Merianos, John J.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,190,644, Cl. 424-70.000.

Merrell, Patrick F.: *See*—
Avina, Raymond; and Merrell, Patrick F., 4,190,870, Cl. 360-98.000.

Merrell Toraude et Compagnie: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,190,586, Cl. 260-326.450.

Mesaros, Louis; and Mollard, Paul, to Produits Chimiques Ugine Kuhlmann. Processes for preparing sodium percarbonate. 4,190,635, Cl. 423-415.00P.
Messer Griesheim GmbH: *See—*
Soecknick, Erhard; and Weimar, Erich, 4,190,473, Cl. 156-80.000.
Messerschmitt-Boelkow-Blohm GmbH: *See—*
Bielefeldt, Ernst-August, 4,190,078, Cl. 137-561.00R.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Baum, Werner; and Munding, German, 4,190,121, Cl. 175-14.000.
Metal Bellows Corporation: *See—*
Sampson, Edward J., 4,190,048, Cl. 128-215.000.
Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. α-Acetylenic derivatives of α-amino acids. 4,190,586, Cl. 260-326.450.
Metzger, Karl G.: *See—*
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.
Mezogazdasagi Foiskola, Kaposvar: *See—*
Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, 4,190,020, Cl. 119-14.080.
Michaels, Robert L.: *See—*
Robillard, David R.; and Michaels, Robert L., 4,189,825, Cl. 29-574.000.
Michalik, Horst B.; and Weschenfelder, Otto T., to Koenig & Bauer Aktiengesellschaft. Folder assembly for book folding. 4,190,243, Cl. 270-66.000.
Microdot Mfg., Inc.: *See—*
Zitting, Gordon T., 4,190,259, Cl. 277-165.000.
Mikelsons, Valdis: *See—*
Dorer, Gary L.; and Mikelsons, Valdis, 4,190,321, Cl. 350-165.000.
Mikulic, Kreso. Alternating current motor with adjustable output torque by means of adjustable magnetic bars. 4,190,794, Cl. 318-831.000.
Miles, Brynley J.: *See—*
Thomson, Alan R.; and Miles, Brynley J., 4,190,576, Cl. 260-122.000.
Miles Laboratories, Inc.: *See—*
Bauer, Robert, 4,190,419, Cl. 23-230.00B.
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., to United States of America, Navy. Protected calcium anode. 4,190,704, Cl. 429-103.000.
Mileti, Robert A., to Fibco Inc. Impact attenuator. 4,190,275, Cl. 293-102.000.
Miller, Arthur F.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,190,556, Cl. 252-432.000.
Miller, Gabriel L.; and Robinson, David A. H., to Bell Telephone Laboratories, Incorporated. Noncontacting measurement of hall effect in a wafer. 4,190,799, Cl. 324-239.000.
Miller, Joseph N.: *See—*
Cornwell, Alexander M., Jr.; and Miller, Joseph N., 4,190,192, Cl. 232-17.000.
Miller, Miles C.: *See—*
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C., 4,190,476, Cl. 156-218.000.
Miller, Robert E.: *See—*
Follin, James W.; and Miller, Robert E., 4,190,818, Cl. 367-138.000.
Miller, Stephen H.: *See—*
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,190,420, Cl. 422-63.000.
Miller, Stephen J.; and Hughes, Thomas R., to Chevron Research Company. Combination process for upgrading naphtha. 4,190,519, Cl. 208-79.000.
Milsco Manufacturing Company: *See—*
Ahrens, John R., 4,190,697, Cl. 428-315.000.
Minnesota Mining and Manufacturing Company: *See—*
Campbell, Douglas D., 4,190,550, Cl. 252-93.000.
Dorer, Gary L.; and Mikelsons, Valdis, 4,190,321, Cl. 350-165.000.
Roswell, Terry E., 4,189,800, Cl. 7-107.000.
Miranti, Joseph P., Jr., to Dayco Corporation. Mobius strip bandsaw blade. 4,189,968, Cl. 83-816.000.
Mitchell, Wayne R., to Prismo Universal Corporation. Road marking apparatus and method. 4,190,205, Cl. 239-129.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, 4,190,276, Cl. 293-133.000.
Mitsubishi Petrochemical Company Limited: *See—*
Samejima, Hiroshi; and Kanayama, Kaoru, 4,190,719, Cl. 528-103.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.
Mitsuhashi, Yoshinobu: *See—*
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Ito, Akira; and Iwata, Kenji, 4,190,614, Cl. 525-106.000.
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.
Mitsuma, Tatsuya: *See—*
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Mitsumi Electric Co., Ltd.: *See—*
Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, 4,190,877, Cl. 361-298.000.
Miura, Mitsuo: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.
Miura, Motohisa, to Nippondenso Co., Ltd. Secondary air supply system for an internal combustion engine. 4,189,915, Cl. 60-290.000.
Miyaguchi, Masao: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.
Miyamoto, Koichi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.
Miyashita, Osamu: *See—*
Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,190,656, Cl. 424-251.000.
Mize, Erbie G.: *See—*
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Mizuhata, Teruo: *See—*
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Mizuse, Tomio: *See—*
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, 4,190,572, Cl. 264-46.400.
Mjulendorf, Oleg S.: *See—*
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., 4,190,630, Cl. 422-249.000.
Mobay Chemical Corporation: *See—*
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.
Mobil Oil Corporation: *See—*
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,190,588, Cl. 260-343.600.
Moebius, Kurt O. Hydraulic assembly tool for tube fittings. 4,189,817, Cl. 29-237.000.
Mohasco Corporation: *See—*
Crawford, Allan H., 4,190,282, Cl. 297-68.000.
Mohawk Data Sciences Corp.: *See—*
Morreall, Donald R.; and Deuel, Ronald F., 4,189,998, Cl. 101-93.310.
Mohler, Sailor. Polarized windshield indicia reflection display system. 4,190,832, Cl. 340-705.000.
Mollard, Paul: *See—*
Mesaros, Louis; and Mollard, Paul, 4,190,635, Cl. 423-415.00P.
Molleken, Reiner: *See—*
Bauer, Kurt; and Molleken, Reiner, 4,190,583, Cl. 260-340.50R.
Monitor Labs, Inc.: *See—*
Etess, Edward, 4,190,368, Cl. 356-417.000.
Monsanto Company: *See—*
Anderson, George J.; Santer, J. Owen; and Desmond, Timothy F., 4,190,700, Cl. 428-524.000.
Feiler, William A., 4,190,634, Cl. 423-321.00S.
Forster, Denis, 4,190,729, Cl. 560-232.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.
Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, 4,190,708, Cl. 435-215.000.
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., to Bio-Rad Laboratories, Inc. Electrophoresis apparatus. 4,190,517, Cl. 204-299.00R.
Moody, George W.; and Meir, Robert A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the. Devices for extracting energy from wave power. 4,189,918, Cl. 60-398.000.
Moore, Fred H.: *See—*
Meece, Meredith W.; Ickes, Charles W.; and Moore, Fred H., 4,190,402, Cl. 417-415.000.
Morel, Claude C. H.: *See—*
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Moreno, Isabel L., to Ford Motor Company. Thermal compensator assembly. 4,190,325, Cl. 350-253.000.
Morgan, William A.: *See—*
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Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Co., Ltd. Preparation of 1,1,1-trihalogeno-4-methyl-3-penten-2-ol. 4,190,730, Cl. 568-845.000.
Mori, Yasunori: *See—*
Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, 4,190,027, Cl. 123-117.00R.
Morikawa, Takitaro: *See—*
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Morimoto, Yukihiko: *See—*
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Morooka, Tsutomu: *See—*
Kishino, Takao; Mera, Yoichi; Makita, Satoru; and Morooka, Tsutomu, 4,190,787, Cl. 313-494.000.

Morreall, Donald R.; and Deuel, Ronald F., to Mohawk Data Sciences Corp. Print hammer and interposer captivating linkage. 4,189,998, Cl. 101-93.310.

Morrow, Warren P., to Scotco, Inc. Rail clip assembly. 4,190,200, Cl. 238-349.000.

Morse, David L.: *See—*
Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., 4,190,451, Cl. 106-47.00Q.

Moss, Charles A.; and Andrews, Boley A., to Vendo Company, The. Apparatus for storing and dispensing generally cylindrical products. 4,190,179, Cl. 221-299.000.

Moss, Gerald E.; and Stevens, Everett E., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Divider network. 4,190,816, Cl. 333-131.000.

Motegi, Masahiko: *See—*
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.

Motorola, Inc.: *See—*
Kilar, Joseph H., 4,190,754, Cl. 200-329.000.
Levine, Stephen N., 4,190,802, Cl. 325-320.000.
Powell, Michael W., 4,190,849, Cl. 357-23.000.

Moulds, Frank G.; and McCord, Michael A., to Diamond International Corporation. Egg packer. 4,189,898, Cl. 53-446.000.

Moulin, Pierre A., to Schlumberger Technology Corporation. Method and apparatus for automatically inscribing magnetic marks on a wireline. 4,190,868, Cl. 360-1.000.

Moutz, John A. Coaster-sled board. 4,190,261, Cl. 280-87.010.

Mt. Pitt Company, The: *See—*
Collins, Edward H., 4,190,165, Cl. 211-60.00R.

Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, to Vyzkumny ustav kozedelny. Fibered sheet material imitating natural leather and method for continuous manufacture thereof. 4,190,694, Cl. 428-212.000.

Mudge, J. Craig, to Digital Equipment Corporation. High speed parallel multiplication apparatus with single-step summand reduction. 4,190,894, Cl. 364-758.000.

Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., to Dow Chemical Company, The. Catalyst activation in oxidation process. 4,190,605, Cl. 260-600.00R.

Mues, Gunther: *See—*
Seibel, Georg; and Mues, Gunther, 4,190,763, Cl. 219-265.000.

Muis, Louis H. Protective composition and method. 4,190,686, Cl. 427-317.000.

Mukasa, Kikuei: *See—*
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Mullane, George W.; and Harrison, Earl K. Single-point cutting tool. 4,190,388, Cl. 408-188.000.

Muller, Heinz: *See—*
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.

Muller, Helmut: *See—*
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Munding, German: *See—*
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Munro, Graham D.: *See—*
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, 4,190,542, Cl. 210-282.000.

Murakami, Kazuo: *See—*
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Murakami, Yoshio: *See—*
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Murata, Moriyasu; and Sai, Fumio, to Kao Soap Co., Ltd. Granular or powdery detergent composition of high fluidity. 4,190,551, Cl. 252-99.000.

Murata, Moriyoshi: *See—*
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, 4,190,771, Cl. 250-385.000.

Murayama, Yuichi; and Sugiyama, Terumasa, to Rank Xerox Limited. Copier document handling system. 4,190,359, Cl. 355-75.000.

Muscatine Lighting Manufacturing Co.: *See—*
Drost, James L.; and Gordin, Myron K., 4,190,881, Cl. 362-250.000.

Mustang Services Company: *See—*
Baldwin, John R., 4,189,843, Cl. 33-199.00R.

Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Catalytic codimerization of norbornadiene with pentadiene. 4,190,610, Cl. 585-361.000.

Myers, Harry K., Jr.: *See—*
Lyons, James E.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,190,611, Cl. 585-361.000.

Naegeli, Peter: *See—*
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Nagano, Masashi: *See—*
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Najer, Henry: *See—*
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.

Nakabayashi, Junichi: *See—*
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Nakagawa, Koji: *See—*
Yamagisi, Hirosi, Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, 4,190,454, Cl. 106-90.000.

Nakai, Katsumi: *See—*
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Nakajima, Katsuji: *See—*
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Nakakita, Tsuneo: *See—*
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Nakamura, Motoharu: *See—*
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Nakamura, Yoshihiko; and Nagano, Masashi, to Shimano Industrial Company, Limited. Speed control device for a bicycle. 4,189,954, Cl. 74-488.000.

Nakano, Masaaki: *See—*
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, 4,190,396, Cl. 415-110.000.

Nakashima, Kunimichi: *See—*
Etoh, Kunihiko; Owa, Kaoru; and Nakashima, Kunimichi, 4,190,889, Cl. 364-474.000.

Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, to Nippon Kayaku Kabushiki Kaisha. Coriolin derivatives and process for producing the same. 4,190,589, Cl. 260-343.600.

Nakazawa, Nobuhiko: *See—*
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.

Nalco Chemical Company: *See—*
Kaplan, Roy I., 4,190,463, Cl. 134-3.000.

Naoi, Takashi; and Horie, Ikutaro, to Fuji Photo Film Co., Ltd. Antiadhesive photographic materials and method of improving antiadhesive property of photographic light-sensitive materials. 4,190,449, Cl. 430-539.000.

National Engineering Company: *See—*
Rikker, Leslie D., 4,190,369, Cl. 366-16.000.

National Research Development Corporation: *See—*
Pyne, Clive R.; and Welsh, Barry L., 4,190,804, Cl. 328-3.000.

National Research Institute for Metals: *See—*
Kametani, Hiroshi; and Mitsuma, Tatsuya, 4,190,508, Cl. 204-151.000.

National Semiconductor Corporation: *See—*
Redfern, Thomas P., 4,190,854, Cl. 357-51.000.

Nau, Hans-Heinrich: *See—*
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.

NCR Corporation: *See—*
Hanlon, Alfred G., 4,190,098, Cl. 165-1.000.

Neal, Robert L.: *See—*
Hutson, John W.; and Neal, Robert L., 4,190,346, Cl. 354-324.000.

Negishi, Yasuo: *See—*
Takeda, Kazutoki; Negishi, Yasuo; and Hibino, Yutaka, 4,190,485, Cl. 156-583.900.

Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, to Chemische Werke Huls AG. Process for working up distillation residues from the hydroformylation of propene. 4,190,731, Cl. 568-914.000.

Nelms, Thomas G., to Rolex Paper Company Ltd. Tubular containers. 4,190,187, Cl. 229-5.500.

Nelson, Colin: *See—*
Hamilton, Alexander; and Nelson, Colin, 4,190,578, Cl. 260-150.000.

Nelson, Frank: *See—*
Donohue, James J.; Gillett, Kenneth; Holt, Charles P.; Ling, Andrew T.; Malinich, Richard M.; and Nelson, Frank, 4,190,350, Cl. 355-14.00R.

Nelson, Philip A. Bounceless high pressure drop cascade impactor and a method for determining particle size distribution of an aerosol. 4,189,937, Cl. 73-28.000.

Nelson Research & Development Company: *See—*
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,190,673, Cl. 424-324.000.

Netes, Leonid Y.: *See—*
Teplinsky, Anatoly D.; Ryvkis, Yakov M.; Snezhnoi, Rostislav L.; and Netes, Leonid Y., 4,190,096, Cl. 164-158.000.

Neufang, Karlheinz: *See—*
Schlichte, Max; and Neufang, Karlheinz, 4,190,740, Cl. 179-15.0AT.

Neumann, Herwig. Concrete construction element system for erecting plant accommodating walls. 4,190,384, Cl. 405-284.000.

Neumann, Werner: *See—*
Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, 4,190,731, Cl. 568-914.000.

New Hampshire Ball Bearings, Inc.: *See—*
Scalzi, Louis M., 4,190,300, Cl. 308-4.00A.

Neyenhuys, Theodoor. Method and apparatus for assembling reels. 4,189,823, Cl. 29-464.000.

Nibby, Chester M., Jr.: *See—*
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,190,901, Cl. 365-72.000.

Nicholson, Charles B., to Albany International Corp. Shower nozzle for fabric conditioner. 4,190,204, Cl. 239-109.000.

Nicholson, Terence P., to Corru-Seals Inc. Method of manufacturing metallic spirally wound gaskets. 4,189,819, Cl. 29-417.000.

Nieberle, Juergen: *See*—
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.
Nieder, Charles E. Rock splitting attachment for a breaking hammer. 4,190,293, Cl. 299-23.000.
Niederhauser, Donald O., to Du Pont de Nemours, E. I., and Company. Hydraulically needling fabric of continuous filament textile and staple fibers. 4,190,695, Cl. 428-234.000.
Niedermeyer, William P. Solar energy collector-light emitting panel. 4,190,036, Cl. 126-439.000.
Niedermeyer, William P. Solar energy collector. 4,190,037, Cl. 126-438.000.
Niedziejko, Edward M.: *See*—
Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., 4,189,896, Cl. 53-431.000.
Niemeijer, Klaas B., to Koninklijke Scholten-Honig N.V. Radial multihydrocyclone. 4,190,523, Cl. 209-211.000.
Nihon Takushu Noyaku Seizo K.K.: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.
Nikitkin, Vasily D.: *See*—
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onoaovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.
Nilsson, Olle: *See*—
Hard af Segerstad, Sverker; and Nilsson, Olle, 4,190,367, Cl. 356-354.000.
Nippon Electric Co., Ltd.: *See*—
Shintaku, Keiichi, 4,190,511, Cl. 204-192.00P.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Katayama, Shinji; and Murakami, Kazuo, 4,189,969, Cl. 84-1.140.
Mantani, Rokurota, 4,189,971, Cl. 84-1.240.
Yamada, Shigeru; and Ichikawa, Kiyoshi, 4,189,972, Cl. 84-1.250.
Nippon Kayaku Kabushiki Kaisha: *See*—
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.
Nippon Kogaku K.K.: *See*—
Maida, Osamu, 4,190,340, Cl. 354-173.000.
Sugimori, Shiro, 4,190,341, Cl. 354-173.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,190,699, Cl. 428-412.000.
Nippon Steel Bolten Company Ltd.: *See*—
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.
Nippon Steel Corporation: *See*—
Kitayama, Minoru; and Nakamura, Motoharu, 4,190,468, Cl. 148-12.00A.
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, 4,190,887, Cl. 364-472.000.
Nippondenso Co., Ltd.: *See*—
Miura, Motohisa, 4,189,915, Cl. 60-290.000.
Nishida, Takashi: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.
Nishimura, Michio: *See*—
Fujikawa, Tetsuzo; and Nishimura, Michio, 4,190,023, Cl. 123-41.720.
Nishimura, Takeo; Matsui, Mikihiro; Mizuse, Tomio; and Ishizaki, Shunji, to Kuraray Co., Ltd. Method of producing a leather-like sheet with a delicate appearance and a deluxe hand. 4,190,572, Cl. 264-46.400.
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, to Nippon Steel Corporation; and Nippon Steel Bolten Company Ltd. Screwed connection having improved fatigue strength. 4,189,975, Cl. 85-1.00T.
Nitta, Tomio, to Tokai Seiki Co., Ltd. Disposable cigarette gas lighter with snuffing cover. 4,190,412, Cl. 431-151.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.
NL Industries, Inc.: *See*—
Backus, Harold A., 4,189,805, Cl. 16-130.000.
Noel Bibby Limited: *See*—
Bibby, Noel, 4,190,010, Cl. 112-419.000.
Noerager, Jere A.: *See*—
Knaus, Ernest; Goubeaux, Dale C.; Dunne, Anthony L.; Lucas, George A.; and Noerager, Jere A., 4,190,381, Cl. 405-72.000.
Noll, Klaus; and Pedain, Josef, to Bayer Aktiengeseilschaft. Water-dispersible polyurethanes. 4,190,566, Cl. 260-29.2TN.
Nomura, Katsuhiko: *See*—
Kano, Motomi; Hirakoso, Keiichiro; and Nomura, Katsuhiko, 4,190,760, Cl. 219-128.000.
Norberg, Lars-Gunnar: *See*—
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.
North, John W. Process and apparatus for producing cellulated vitreous refractory material in prescribed shapes and products therefrom. 4,190,416, Cl. 432-128.000.
Northern Illinois Gas Company: *See*—
Long, George, 4,189,925, Cl. 60-652.000.
Northwest Sanitation Products, Inc.: *See*—
Williamson, Clifton L.; Hocker, Harvey L.; and Alcamo, John M., 4,189,793, Cl. 4-228.000.
Nougarede, Francis: *See*—
Despois, Jacques; and Nougarede, Francis, 4,190,099, Cl. 165-45.000.
Noveroske, Robert L.: *See*—
Fenstermacher, Myk R.; and Noveroske, Robert L., 4,190,662, Cl. 424-263.000.
Nozaki, Mineo; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Printer. 4,189,997, Cl. 101-93.090.
NSK-Warner K. K.: *See*—
Ueda, Takeo, 4,190,213, Cl. 242-107.40A.
Nystrom, Walther: *See*—
Jones, Robert E., Jr.; and Nystrom, Walther, 4,190,872, Cl. 360-125.000.
O. Dorries GmbH: *See*—
Meisenberg, Ralf, 4,190,478, Cl. 156-252.000.
O'Connor, William M., to Avco Corporation. Filter system for agricultural aircraft. 4,190,217, Cl. 244-53.00B.
Odagiri, Shigeyoshi; Iizuka, Yoshikatsu; and Danmura, Tugiaki, to Mitsumi Electric Co., Ltd. Miniature variable capacitor. 4,190,877, Cl. 361-298.000.
O'Dell, Larry A., to Dresser Industries, Inc. Apparatus for interconnecting segmented cutter drums of a rotary cutter mechanism. 4,190,296, Cl. 299-89.000.
Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., to Baker International Corporation. Well bore apparatus with hydraulically releasable tubing seal unit. 4,190,107, Cl. 166-120.000.
Odstrchel, Gerald: *See*—
Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., 4,190,535, Cl. 210-83.000.
Oelke, Waldemar W.; and Poplawsky, Ralph C., to Libbey-Owens-Ford Company. Method of and apparatus for thermally cutting glass. 4,190,184, Cl. 225-2.000.
Officine Cimbali Giuseppe S.p.A.: *See*—
Haddad, Adrien, 4,189,991, Cl. 99-302.00R.
Ogawa, Haruo: *See*—
Sugai, Hiroshi; and Ogawa, Haruo, 4,189,836, Cl. 433-127.000.
Ogawa, Hiroshi: *See*—
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.
Ogawa, Ryota; and Itoh, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide angle zoom lens with high zoom ratio. 4,190,323, Cl. 350-184.000.
Ogawa, Shinsaku; Yoshida, Mitsuo; and Shiroki, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolysis of sodium chloride in an ion-exchange membrane cell. 4,190,505, Cl. 204-98.000.
Ohashi, Shin-Ichi: *See*—
Kimura, Hiroyuki; Fukushima, Isao; Ohashi, Shin-Ichi; and Masuda, Yoshinori, 4,190,836, Cl. 340-762.000.
Ohmori, Koichiro, to Honshuseishi Kabushiki Kaisha. Container and cone for same. 4,190,188, Cl. 229-5.600.
Ohmura, Hidemasa; and Saito, Masahiro, to Kao Soap Co., Ltd. Aqueous cationic polyurethane emulsion with glycidyl ether curing agent. 4,190,567, Cl. 260-29.2TN.
Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Laser COM with line deflection mirror inertia compensation. 4,190,867, Cl. 358-285.000.
Ohno, Yukihiro; and Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Slider reciprocating driving apparatus for use with electrophotographic copying machine. 4,190,349, Cl. 355-8.000.
Okamoto, Satoru: *See*—
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.
Oku, Toshio: *See*—
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.
Okuli Oy: *See*—
Halonen, Tuomo, 4,190,190, Cl. 229-17.00R.
Okuno, Youichi; Yokota, Hideo; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Data recording camera. 4,190,338, Cl. 354-106.000.
Oliff, James R.; and Watkins, Richard K., to Mead Corporation, The. Article carrier and blank therefor. 4,190,149, Cl. 206-145.000.
Oliva, Richard A. Method for removing restorations from teeth. 4,189,838, Cl. 433-167.000.
Olsen, C. Eric, to California Medical Developments, Inc. Sponge disposal tray. 4,190,153, Cl. 206-362.000.
Olson, Donald N.: *See*—
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C., 4,190,476, Cl. 156-218.000.
Olsson, Torsten, to Aktiebolaget ASEA-ATOM. Spacer with polygonal interconnetors. 4,190,494, Cl. 176-76.000.
Olympus Optical Company, Ltd.: *See*—
Maitani, Yoshihisa, 4,190,335, Cl. 354-34.000.
O'Meara, William R.: *See*—
Buescher, Eugene J., 4,190,162, Cl. 206-625.000.
O'Melia, Lawrence: *See*—
Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, 4,190,088, Cl. 138-126.000.
Omura, Yoshiaki: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,190,730, Cl. 568-845.000.
O'Neal, Winston R.; and Richardson, Stephen L., to Black Diamond Service Company, Inc. Mine roof bolter. 4,190,116, Cl. 173-38.000.
O'Neil, Roderick J. Nose pad for eyeglass frames. 4,190,334, Cl. 351-137.000.

Onosovsky, Evgeny V.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.

Orita, Naoki, to Amada Company, Limited. Method and devices for safety for mechanical presses. 4,190,143, Cl. 192-145.000.

Osaka Gas Company, Ltd.: *See—*
Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, 4,190,554, Cl. 252-412.000.

Oshima, Kohei: *See—*
Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, 4,190,651, Cl. 424-209.000.

Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, to American Can Company. Pouch. 4,190,477, Cl. 156-244.110.

Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, to AEG-Kanis Turbinenfabrik GmbH. Method for manufacturing single stage geared turbines. 4,189,813, Cl. 29-156.80R.

Ota, Yoshihiko, to Victor Company of Japan, Ltd. Slow motion tape driving system in a recording and/or reproducing apparatus. 4,190,869, Cl. 360-10.000.

Otis, Roger W.; and Otis, Stephen H. Floating dry storage facility for small boats. 4,190,013, Cl. 114-263.000.

Otis, Stephen H.: *See—*
Otis, Roger W.; and Otis, Stephen H., 4,190,013, Cl. 114-263.000.

Ottos, James G., to RCA Corporation. Apparatus and method for automatically aligning a multibeam electron gun assembly with a cathode-ray tube bulb. 4,189,814, Cl. 29-25.160.

Oude Alink, Bernardus A., to Petrolite Corporation. Dithioles. 4,190,727, Cl. 549-36.000.

Owa, Kaoru: *See—*
Etoh, Kunihiko; Owa, Kaoru; and Nakashima, Kuaimichi, 4,190,889, Cl. 364-474.000.

Owens-Illinois, Inc.: *See—*
Boling, Norman L., 4,190,465, Cl. 136-89.0FC.

Oxy-Catalyst, Inc.: *See—*
Retallick, William B., 4,190,559, Cl. 252-477.00R.

Ozaki, Yasutaka: *See—*
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.

Paden, Jack R. Smoking device. 4,190,062, Cl. 131-180.000.

Padula, William V., I: *See—*
Padula, William V., II; and Padula, William V., I, 4,190,331, Cl. 351-5.000.

Padula, William V., II; and Padula, William V., I. Ophthalmic measuring instrument with angle measuring means. 4,190,331, Cl. 351-5.000.

Paker, Alexander D. Leaf mulcher attachment for lawn mowers. 4,189,904, Cl. 56-255.000.

Pallaske, James: *See—*
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., 4,190,749, Cl. 200-11.0TW.

Panepinto, William, Jr.: *See—*
Joyce, Thomas F.; and Panepinto, William, Jr., 4,190,885, Cl. 364-200.000.

Panetti, Romolo, to Speno International S.A.; and Frank Speno Railroad Ballast Cleaning Co. Inc. Machine for truing the bearing surface of the rails of a railroad track. 4,189,873, Cl. 51-178.000.

Pao, Joseph Y. C.: *See—*
Harwood, Hugh D.; Pao, Joseph Y. C.; and Stebbings, David W., 4,190,746, Cl. 179-115.50R.

Paret, Dana C. Cigarette dispensing apparatus. 4,190,145, Cl. 194-1.00P.

Parker, Louis W.; and Hedges, Rhey W., to Parker, Louis W. Energy economizer for induction motors. 4,190,793, Cl. 318-800.000.

Parker, Raymond E.: *See—*
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.

Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., to Dynapol. Polymeric agent for releasing 5-aminosalicylic acid or its salts into the gastrointestinal tract. 4,190,716, Cl. 525-334.000.

Pasold, Raymond. Anti-static device for clothes dryers. 4,190,874, Cl. 361-212.000.

Passler, Helmar: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Pastor, Antonio C.: *See—*
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,487, Cl. 156-617.0SP.
Pastor, Ricardo C.; and Pastor, Antonio C., 4,190,640, Cl. 423-500.000.

Pastor, Ricardo C.; and Pastor, Antonio C., to Hughes Aircraft Company. Reactive atmosphere processing method of crystal growth of alkaline earth chlorides. 4,190,487, Cl. 156-617.0SP.

Pastor, Ricardo C.; and Pastor, Antonio C., to Hughes Aircraft Company. Generation of nascent bromine for use in the growth of ultra pure metal bromides. 4,190,640, Cl. 423-500.000.

Patel, Jayantilal N.: *See—*
Malsby, Marc W.; Doty, John S.; and Patel, Jayantilal N., 4,190,316, Cl. 350-96.180.

Patel, Kiritkumar R.: *See—*
Collins, Marcus H.; and Patel, Kiritkumar R., 4,190,136, Cl. 188-367.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,190,442, Cl. 75-252.000.

Patel, Mahesh S., to Eutectic Corporation. Flame spray powder mix. 4,190,443, Cl. 75-252.000.

Patitz, Ellen: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Patterson, Merle W. Earth anchor. 4,189,879, Cl. 52-161.000.

Paul Wurth, S.A.: *See—*
Mailliet, Pierre; and Kirchen, Michel, 4,190,074, Cl. 137-315.000.

Paxall Inc.: *See—*
Silver, Stanley M., 4,189,986, Cl. 93-36.00M.

Payn, Christian: *See—*
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.

Pearce, Junior B. Wheelbarrow apparatus. 4,190,260, Cl. 280-47.310.

Pebler, Alfred R., to Westinghouse Electric Corp. Combustibles sensor. 4,190,499, Cl. 204-1.00T.

Pecoraro, Irmo. Complex structure obtained from the utilization of particular clamps. 4,189,884, Cl. 52-285.000.

Pedain, Josef: *See—*
Noll, Klaus; and Pedain, Josef, 4,190,566, Cl. 260-29.2TN.

Pederson, Jerard M.; and Beckman, William J., Jr. Waste water treatment apparatus. 4,190,543, Cl. 210-332.000.

Pehr, Harold T. Tamperproof package. 4,190,169, Cl. 215-252.000.

Pentapharm A.G.: *See—*
Svendsen, Lars G., 4,190,574, Cl. 260-112.50R.

Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., to Andrew Adams Developing Corporation. Method of fastening and unfastening snap fasteners. 4,189,822, Cl. 29-453.000.

Peter, Bruno E.: *See—*
Allread, John J.; McManamy, Thomas A.; and Peter, Bruno E., 4,190,097, Cl. 164-343.000.

Peter Wukovich OHG: *See—*
Bleyer, Franz, 4,189,935, Cl. 72-452.000.

Petersen, Uwe: *See—*
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.

Peterson, Bertil G., to Tobin-Arp Manufacturing Company. Cylinder head support with air cushion and vacuum hold down. 4,190,240, Cl. 269-21.000.

Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,190,644, Cl. 424-70.000.

Petroleo Brasileiro S.A.-Petrobas: *See—*
Bruening, Wilhelm; and Bruening, Inai M. R. deA., 4,190,425, Cl. 55-67.000.

Petrolite Corporation: *See—*
Oude Alink, Bernardus A., 4,190,727, Cl. 549-36.000.

Pfannmuller, Joachim: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.

Philippi, George J. Trolley-swing. 4,190,248, Cl. 272-87.000.

Phillips Petroleum Company: *See—*
Barton, Hugh M., Jr., 4,190,109, Cl. 166-270.000.
Bertus, Brent J.; McKay, Dwight L.; and Mark, Harold W., 4,190,552, Cl. 252-411.00R.
DeForest, Laurence R., 4,190,189, Cl. 229-5.600.
McDaniel, Max P., 4,190,457, Cl. 106-122.000.

Piber, Earl T., to Eaton Corporation. Snap-action switch of the roller contact type. 4,190,750, Cl. 200-67.0AA.

Pile, Ira: *See—*
Conti, Angelo J.; and Pile, Ira, 4,189,795, Cl. 4-324.000.

Pillsbury Company, The: *See—*
Turpin, Charles H.; and Hoese, Thomas C., 4,190,757, Cl. 219-10.55E.

Pioneer Cover-All, Inc.: *See—*
Bachand, Ernest C., 4,190,526, Cl. 209-245.000.

Pitchon, Esra: *See—*
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., 4,190,428, Cl. 71-29.000.

Pitney-Bowes, Inc.: *See—*
Ariotti, Robert C.; Stahl, Harold M.; and Clifford, Lawrence E., 4,190,018, Cl. 118-690.000.
Macaluso, Paul J.; and Clifford, Lawrence E., 4,190,351, Cl. 355-15.000.

Pittinger, Charles B., Jr. Self-threading filament trimmer system. 4,189,830, Cl. 30-276.000.

Plainer, Hermann: *See—*
Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, 4,190,713, Cl. 521-149.000.

Platt, Leland H., Jr. Apparatus and method to twist tie articles. 4,189,900, Cl. 53-583.000.

Plattier, Marcel: *See—*
Auger, Bernard; Plattier, Marcel; and Teisseire, Paul J., 4,190,561, Cl. 252-522.00R.

Plessey Handel und Investments A.G.: *See—*
Brettle, Jack; and Jackson, Norman F., 4,190,315, Cl. 350-96.120.

Pleus, Edwin F., to Aunt Nellie's Foods, Inc. Method and apparatus for dewatering vegetables and the like. 4,190,678, Cl. 426-478.000.

Pleuss, Mark E., to American Hospital Supply Corporation. Adjustable column. 4,190,377, Cl. 403-108.000.

Ploeger, Kenneth C. Wheel bearing pressure lubricator. 4,190,133, Cl. 184-1.00D.

Plumb, John L.; Cohen, Sheppard; and Ingalls, Paul H., to GTE Sylvania Incorporated. Isolator circuit for use with frequency sensitive switching circuit. 4,190,790, Cl. 315-313.000.

Podboronov, Boris P.; Sokolov, Sergei S.; and Furman, Anatoly V. Multipoint measuring device. 4,190,776, Cl. 307-112.000.
Poettgen, Anton J. Flail shredder. 4,189,901, Cl. 56-10.400.
Poggemiller, Randy L.: *See—*
Herzog, Stanley M.; and Poggemiller, Randy L., 4,190,394, Cl. 414-786.000.
Pohl, Andreas P. I., to Duvelius, Rembert; and Von Stosch, Rudiger Graf. Press for producing shaped articles. 4,190,484, Cl. 156-580.000.
Polaroid Corporation: *See—*
Buzzell, Harold O., 4,190,418, Cl. 8-4.000.
Poller, Dieter: *See—*
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.
Poon, Ching C.: *See—*
Pun, Ching W.; and Poon, Ching C., 4,190,702, Cl. 429-4.000.
Poplawsky, Ralph C.: *See—*
Oelke, Waldemar W.; and Poplawsky, Ralph C., 4,190,184, Cl. 225-2.000.
Potter, Robert H., to Auto Specialties Manufacturing Company. Method of manufacturing screw jack tubes. 4,189,821, Cl. 29-432.000.
Powell, Michael W., to Motorola, Inc. Electronic-beam programmable semiconductor device structure. 4,190,849, Cl. 357-23.000.
Powers, Samuel T., to Albuquerque Patents, Ltd. Wheelchair with shock absorber. 4,190,263, Cl. 280-242.0WC.
PPG Industries, Inc.: *See—*
Hoekje, Howard H.; and May, Russell R., 4,190,638, Cl. 423-473.000.
Preston, John L., Jr., to United Technologies Corporation. Method for producing hydrogen. 4,190,641, Cl. 423-653.000.
Prisma Neon AB: *See—*
Ahlgren, Stig B., 4,189,859, Cl. 40-505.000.
Prismo Universal Corporation: *See—*
Mitchell, Wayne R., 4,190,205, Cl. 239-129.000.
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, to Mobay Chemical Corporation; and Bayer Aktiengesellschaft. Process for dyeing and printing sheets. 4,190,417, Cl. 8-2.50R.
Produits Chimiques Ugine Kuhlmann: *See—*
Mesaros, Louis; and Mollard, Paul, 4,190,635, Cl. 423-415.00P.
Pronko, Vladimir G.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.
Provenzano, Jack. Astrological device. 4,189,853, Cl. 35-44.000.
Prussin, Samuel: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,190,680, Cl. 427-4.000.
Pryke, David S.: *See—*
Pryke, John F. S.; and Pryke, David S., 4,190,383, Cl. 405-252.000.
Pryke, John F. S.; and Pryke, David S., to Pynford Limited. Structural element. 4,190,383, Cl. 405-252.000.
Pun, Ching W.; and Poon, Ching C. Batteries. 4,190,702, Cl. 429-4.000.
Purdy, John W., to Wesgar Industries Ltd. Adapter for exhaust actuated devices. 4,190,269, Cl. 285-38.000.
Pyne, Clive R.; and Welsh, Barry L., to National Research Development Corporation. Signal-conditioning circuits. 4,190,804, Cl. 328-3.000.
Pynford Limited: *See—*
Pryke, John F. S.; and Pryke, David S., 4,190,383, Cl. 405-252.000.
R A Electronics, Inc.: *See—*
Kemp, James A., 4,190,838, Cl. 343-18.00E.
R.W. Hartnett Company: *See—*
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,189,996, Cl. 101-37.000.
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., to Gallaher, Kantlehner & Associates, Inc. Manufacture of sealed-end tubular thermoplastic net bagging. 4,190,690, Cl. 428-35.000.
Rabinowitz, Mario. Persistent current superconducting method and apparatus. 4,190,817, Cl. 335-216.000.
Racz, Janos A.: *See—*
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.
Rank Xerox Limited: *See—*
Murayama, Yuichi; and Sugiyama, Terumasa, 4,190,359, Cl. 355-75.000.
Sasuga, Kazuyasu, 4,190,246, Cl. 271-145.000.
Sasuga, Kazuyasu, 4,190,358, Cl. 355-75.000.
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., to Exxon Research & Engineering Co. Solid state cell with alkali metal halo-alkali thiocyanate electrolyte. 4,190,706, Cl. 429-191.000.
Rapicom, Inc.: *See—*
Weber, Donald R., 4,190,824, Cl. 340-347.0AD.
Rasche, Peter: *See—*
Prochaska, Helmuth; Baumann, Gert F.; Rasche, Peter; Muller, Heinz; and Gonzales-Dorner, Alberto, 4,190,417, Cl. 8-2.50R.
Rauf, James P.: *See—*
Corsmeier, Robert J.; and Rauf, James P., 4,190,398, Cl. 415-114.000.
Ravallo, Robert J., to General Foods Corporation. Plant care composition. 4,190,427, Cl. 71-29.000.
Ravallo, Robert J.: *See—*
Colton, Martin S.; Pitchon, Esra; and Ravallo, Robert J., 4,190,428, Cl. 71-29.000.
Raytheon Company: *See—*
Bowen, Robert F.; and Knight, Philip A., Jr., 4,190,077, Cl. 137-550.000.
Robillard, David R.; and Michaels, Robert L., 4,189,825, Cl. 29-574.000.
RCA Corporation: *See—*
Bendell, Sidney L., 4,190,865, Cl. 358-219.000.
Checki, Angelo, Jr., 4,190,735, Cl. 174-52.0FP.
Dischert, Robert A.; and Thorpe, Laurence J., 4,190,863, Cl. 358-210.000.
Dischert, Robert A., 4,190,864, Cl. 358-210.000.
Hicks, James E., 4,190,791, Cl. 315-408.000.
Hulls, Leonard R.; Hadden, Stephen C.; and Armstrong, [illegible]ee R., 4,189,940, Cl. 73-117.300.
Ottos, James G., 4,189,814, Cl. 29-25.160.
Spong, Fred W., 4,190,843, Cl. 346-1.100.
Sterzer, Fred, 4,190,053, Cl. 128-399.000.
Recaro GmbH & Co.: *See—*
Schmidhuber, Karl; and Lehmann, Hans D., 4,190,284, Cl. 297-194.000.
Strien, Werner, 4,190,290, Cl. 297-408.000.
Redemann, Peter, to Schering, A.G. Workplace equipment. 4,190,002, Cl. 108-50.000.
Redfern, Thomas P., to National Semiconductor Corporation. Trim structure for integrated capacitors. 4,190,854, Cl. 357-51.000.
Redman, Charles M., to United States of America, Army. Thermal image camera with storage. 4,190,769, Cl. 250-332.000.
Reents, Margaret J.: *See—*
Kuo, Mau-Jung; Reents, Margaret J.; and Feder, Joseph, 4,190,708, Cl. 435-215.000.
Regan, A. Michael, to Regan Offshore International, Inc. Moveable guide structure for a sub-sea drilling template. 4,190,120, Cl. 175-7.000.
Regan Offshore International, Inc.: *See—*
Regan, A. Michael, 4,190,120, Cl. 175-7.000.
Regie Nationale des Usines Renault: *See—*
Leichle, Claude, 4,190,823, Cl. 340-347.0NT.
Reichert, Gerhard: *See—*
Loos, Herbert; Heckmaier, Manfred; and Reichert, Gerhard, 4,190,387, Cl. 409-33.000.
Reinders, Foppe J.: *See—*
Brokken-Zijp, Josephina C. M.; and Reinders, Foppe J., 4,190,705, Cl. 429-111.000.
Reinhoudt, David N.: *See—*
De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., 4,190,462, Cl. 134-2.000.
Reisgies, Rolf W. Automatic stimulation apparatus for milking machines. 4,190,021, Cl. 119-14.440.
Reiter, Richard L. Musical instrument carrying case. 4,190,152, Cl. 206-314.000.
Reliance Electric Company: *See—*
Chung, Jackson, 4,189,962, Cl. 74-802.000.
Remington Products, Inc.: *See—*
Kulpa, Walter J., 4,190,065, Cl. 132-33.00R.
Repla International S.A.H.: *See—*
Sotos, Juan N., 4,189,809, Cl. 24-204.000.
Resch, Werner: *See—*
Schoop, Josef; Resch, Werner; and Damme, Heinz, 4,190,238, Cl. 266-270.000.
Research Corporation: *See—*
Curtiss, Roy, III, 4,190,495, Cl. 435-172.000.
Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., 4,190,579, Cl. 260-239.00A.
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,190,079, Cl. 137-561.00R.
Retallick, William B., to Oxy-Catalyst, Inc. Metal catalyst support having rectangular cross-section. 4,190,559, Cl. 252-477.00R.
Reuland, Joachim: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.
Rexnord Inc.: *See—*
Harris, Bernard, 4,189,985, Cl. 92-153.000.
Rheem Manufacturing Company: *See—*
Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., 4,189,897, Cl. 53-434.000.
Rhinehart, Richard W.: *See—*
Jackson, Harold P.; and Rhinehart, Richard W., 4,189,903, Cl. 56-255.000.
Rhodes, Herbert C. Cookie forming apparatus. 4,190,410, Cl. 425-239.000.
Ri-El Ricerche Elettroniche S.p.A.: *See—*
Righi, Nardino; and Canni Ferrari, Mario, 4,189,949, Cl. 74-10.330.
Richardson, Daniel E., to Shure Manufacturing Corporation. Transaction drawer. 4,190,004, Cl. 109-19.000.
Richardson, Stephen L.: *See—*
O'Neal, Winston R.; and Richardson, Stephen L., 4,190,116, Cl. 173-38.000.
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, to Upjohn Company, The. Amide-containing diisocyanates and preparation thereof. 4,190,599, Cl. 260-453.00P.
Richtmyer, Lawson E.: *See—*
Shovll, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., 4,190,000, Cl. 102-19.200.

Rickman, David P.: *See*—
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, 4,190,542, Cl. 210-282.000.

Ricks, Dennis E. Three dimensional television system. 4,190,856, Cl. 358-88.000.

Ricoh Company, Ltd.: *See*—
Ohno, Yukihiro; and Yanagawa, Nobuyuki, 4,190,349, Cl. 355-8.000.

Riebel, Hans-Jochem: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.

Ries, Dieter: *See*—
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.

Riggins, Robert J., Sr. Chalk line protracting tool. 4,189,844, Cl. 33-414.000.

Riggs, Olen L., Jr., to Transworld Drilling Company. Process for measuring internal metal stress. 4,190,501, Cl. 204-1.00T.

Righi, Nardino; and Canni Ferrari, Mario, to Ri-El Ricerche Elettroniche S.p.A. Pushbutton tuner. 4,189,949, Cl. 74-10.330.

Riker Laboratories, Inc.: *See*—
Fletcher, Vernon R., 4,190,590, Cl. 260-346.730.

Rikker, Leslie D., to National Engineering Company. Method and apparatus for making molds. 4,190,369, Cl. 366-16.000.

Rinno, Helmut: *See*—
Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, 4,190,573, Cl. 260-112.00R.

Risi, Roberto. Device for picking up sheets from a magazine in a packaging machine. 4,190,244, Cl. 271-33.000.

Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., to United States of America, Navy. Faired tow cable with stubs for strum reduction. 4,190,012, Cl. 114-243.000.

Ritten Corporation, Ltd., The: *See*—
Smart, William L.; and Hoenig, Stuart A., 4,190,875, Cl. 361-228.000.

Ritter, Gerhard: *See*—
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.

Ritter, Josef: *See*—
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.

Ritter, Klaus: *See*—
Gott, Hans; Ritter, Gerhard; Ritter, Klaus; and Ritter, Josef, 4,190,758, Cl. 219-56.000.

Rizzo, Joseph P.: *See*—
Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., 4,189,896, Cl. 53-431.000.

Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, to Howmet Turbine Components Corporation. Ceramic cores for manufacturing hollow metal castings. 4,190,450, Cl. 106-38.900.

Robbins Company, The: *See*—
Fikse, Tyman H., 4,190,294, Cl. 299-33.000.

Robert Bosch GmbH: *See*—
Forster, Herbert, 4,190,878, Cl. 361-305.000.
Hofmann, Eberhard; and Weyrich, Erwin, 4,190,401, Cl. 417-313.000.

Robertshaw Controls Company: *See*—
Decker, Cloyd E., 4,190,764, Cl. 219-506.000.

Robillard, David R.; and Michaels, Robert L., to Raytheon Company Integrated test and assembly device. 4,189,825, Cl. 29-574.000.

Robins, John S. Method for producing wood smoke on a charcoal grille. 4,190,677, Cl. 426-315.000.

Robinson, David A. H.: *See*—
Miller, Gabriel L.; and Robinson, David A. H., 4,190,799, Cl. 324-239.000.

Robinson, George W., to Scovill Manufacturing Company. Electric pressing iron having indicating ready light. 4,189,855, Cl. 38-82.000

Robinson, Glen P., Jr.: *See*—
Kelly, Jack R., Jr.; and Robinson, Glen P., Jr., 4,190,800, Cl. 325-37.000.

Robinson, William D., to Delta Materials Research Limited. Noise abatement techniques and systems. 4,190,131, Cl. 181-296.000.

Rockwell International Corporation: *See*—
Weber, Robert J., 4,190,807, Cl. 331-1.00A.

Roddy, John. Rock drill bit loading device. 4,190,123, Cl. 175-325.000.

Rogers Corporation: *See*—
Langford, Gordon B., 4,190,748, Cl. 200-5.00A.

Rogers, David W., to General Motors Corporation. Vacuum actuated switch. 4,190,752, Cl. 200-81.500.

Rogers, Edward J., to S & C Electric Company. Switch operator uncoupling mechanism. 4,190,755, Cl. 200-334.000.

Rogic, Milorad M.: *See*—
Masilamani, Divakaran; and Rogic, Milorad M., 4,190,612, Cl. 585-378.000.

Rohm GmbH: *See*—
Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, 4,190,713, Cl. 521-149.000.

Rohm and Haas Company: *See*—
Drennen, Thomas J.; and Gill, Robert A., 4,190,491, Cl. 162-76.000.
Martorano, Richard; and Brendley, William H., 4,190,693, Cl. 428-209.000.

Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See*—
Brandes, Harry, 4,190,245, Cl. 271-278.000.

Rolex Paper Company Ltd.: *See*—
Nelms, Thomas G., 4,190,187, Cl. 229-5.500.

Rolls-Royce Limited: *See*—
Carlisle, Denis R., 4,189,913, Cl. 60-39.14R.

Roloff, Hermann: *See*—
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Rosemount Engineering Company Limited: *See*—
Hunter, Donald N.; and Wyatt, Lesley J., 4,190,453, Cl. 106-85.000.

Rosen, Perry: *See*—
Holland, George W.; Jernow, Jane L.; and Rosen, Perry, 4,190,587, Cl. 260-343.30P.

Rosen, Robert: *See*—
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., 4,190,882, Cl. 363-26.000.

Rostock, Fredrik: *See*—
Lemisch, Ellen; and Rostock, Fredrik, 4,190,287, Cl. 297-466.000.

Roswell, Terry E., to Minnesota Mining and Manufacturing Company. Self-contained breadboard wiring tool. 4,189,800, Cl. 7-107.000.

Roth, Jac M.; and Roth nee Werner, Veronika. Electrical contact switch with an extremely small actuating movement. 4,190,751, Cl. 200-67.0DB.

Roth nee Werner, Veronika: *See*—
Roth, Jac M.; and Roth nee Werner, Veronika, 4,190,751, Cl. 200-67.0DB.

Rottenkolber, John J.: *See*—
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,189,822, Cl. 29-453.000.

Rottenkolber, Michael L.: *See*—
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,189,822, Cl. 29-453.000.

Rottler Boring Bar Co.: *See*—
Rottler, Donald B.; Engnell, David; and Rottler, Donald B., 4,189,871, Cl. 51-34.00J.

Rottler, Donald B.; Engnell, David; and Rottler, Donald B., to Rottler Boring Bar Co. Honing machine. 4,189,871, Cl. 51-34.00J.

Rottler, Donald B.: *See*—
Rottler, Donald B.; Engnell, David; and Rottler, Donald B., 4,189,871, Cl. 51-34.00J.

Roussel Uclaf: *See*—
Warnant, Julien; Farcilli, Andre; and Medici, Italo, 4,190,658, Cl. 424-256.000.

Rovnyak, Richard M.: *See*—
Jusinskas, Julius, Jr.; Lee, David Q.; and Rovnyak, Richard M., 4,190,745, Cl. 179-18.0AH.

Rowsell, David G.: *See*—
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,190,643, Cl. 424-54.000.

Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. Homogeneous enzyme assay for antibodies. 4,190,496, Cl. 435-7.000.

Rudden, Thomas J., Jr. Path forming game. 4,190,256, Cl. 273-275.000.

Rudzena, William L.: *See*—
Kulle, Lee K.; and Rudzena, William L., 4,190,171, Cl. 215-329.000.

Ruschke, Ricky R., to Baxter Travenol Laboratories, Inc. Gas separating and venting filter. 4,190,426, Cl. 55-185.000.

Russell, Frederick S., to Westvaco Corporation. Display hanger. 4,190,151, Cl. 206-281.000.

Russell, Lillard G., to W. A. Brown & Son, Inc. Air conditioning and dehumidification system. 4,189,929, Cl. 62-175.000.

Rutter, Jerry L.; Bergman, Janice M.; and Bevernitz, Kurt J., to Gulf Oil Corporation. Control of microbial contamination. 4,190,429, Cl. 71-67.000.

Ryan, Ralph L.; and Taitel, Charles M., to Compensating Tension Controls, Inc. Butt splicer. 4,190,483, Cl. 156-504.000.

Ryvkis, Yakov M.: *See*—
Teplinsky, Anatoly D.; Ryvkis, Yakov M.; Snezhnoi, Rostislav L.; and Netes, Leonid Y., 4,190,096, Cl. 164-158.000.

S & C Electric Company: *See*—
Rogers, Edward J., 4,190,755, Cl. 200-334.000.

Sagi, Zsimond L., to Arden Industries, Inc. Device for use in early detection of breast cancer. 4,190,058, Cl. 128-736.000.

Sai, Fumio: *See*—
Murata, Moriyasu; and Sai, Fumio, 4,190,551, Cl. 252-99.000.

Saint-Gobain Industries: *See*—
Fischer, Klaus; and Keul, Robert, 4,190,452, Cl. 106-52.000.
Lavoisey, Yves, 4,189,818, Cl. 29-281.500.

St. Onge, Linda M.: *See*—
Forsythe, Jesse G., Jr.; Johnson, Donald R.; and St. Onge, Linda M., 4,190,530, Cl. 210-31.00R.

Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, to Nihon Takushu Noyaku Seizo K.K. Pesticidally active O-ethyl-S-N-propyl-O-2,2,2-trihaloethyl-phosphoro(thiono)thiolates. 4,190,653, Cl. 424-224.000.

Saito, Makoto, to Tomy Kogyo Co., Inc. Self-powered toy vehicle chassis and automatically interchangeable bodies. 4,189,864, Cl. 46-202.000.

Saito, Masahiro: *See*—
Ohmura, Hidemasa; and Saito, Masahiro, 4,190,567, Cl. 260-29.2TN.

Sakakibara, Naoji, to Aisin Seiki Co., Ltd. Automobile speed control method and system. 4,190,026, Cl. 123-102.000.

Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.
Sakamaki, Shozo: *See*—
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, 4,190,454, Cl. 106-90.000.
Sakamoto, Shizuichi: *See*—
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, 4,190,396, Cl. 415-110.000.
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, to Agency of Industrial Science & Technology. Optical memory playback apparatus. 4,190,775, Cl. 250-570.000.
Salafia, Sebastian J.: *See*—
Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., 4,190,404, Cl. 425-8.000.
Salvaudon, Laurence; and Charlot, Jean-Claude, to Thomson-CSF. System for protecting a vehicle-borne tracking radar against an off-target jammer. 4,190,837, Cl. 343-16.00M.
Samejima, Hiroshi; and Kanayama, Kaoru, to Mitsubishi Petrochemical Company Limited. Imidazolidone polyamines as epoxy curing agents. 4,190,719, Cl. 528-103.000.
Samibem, S.A.: *See*—
Kaetzel, Pierre, 4,189,902, Cl. 56-15.600.
Sampson, Edward J., to Metal Bellows Corporation. Infusate injection apparatus. 4,190,048, Cl. 128-215.000.
Samuels, George A. Modular furniture structure. 4,190,738, Cl. 179-1.00E.
Samuelsson, Bengt I.: *See*—
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.
Sander, Hans: *See*—
Kroker, Ruprecht; Sander, Hans; and Gausepohl, Hermann, 4,190,569, Cl. 260-31.600.
Sandhu, Mohammad A.: *See*—
Martin, Thomas W.; Sandhu, Mohammad A.; and Savage, Dennis J., 4,190,446, Cl. 430-25.000.
Sandoz, Inc.: *See*—
Hardtmann, Goetz E., 4,190,659, Cl. 424-258.000.
Sandoz Ltd.: *See*—
Funfschilling, Peter, 4,190,603, Cl. 260-590.00B.
Trueb, Werner, 4,190,430, Cl. 71-86.000.
Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, to Toyoda-Koki Kabushiki-Kaisha. Index apparatus for rotary table. 4,189,963, Cl. 74-821.000.
Santer, J. Owen: *See*—
Anderson, George J.; Santer, J. Owen; and Desmond, Timothy F., 4,190,700, Cl. 428-524.000.
Santiago, Romeo S.; and Decker, Llewellyn, to General Electric Company. Adjustable gap electrode arrangement for electrolytically heated steam iron. 4,190,762, Cl. 219-245.000.
Sanyo Electric Company, Ltd.: *See*—
Imamura, Eigo, 4,190,803, Cl. 325-455.000.
Sarantakis, Dimitrios, to American Home Products Corporation. Polypeptides related to somatostatin. 4,190,575, Cl. 260-112.50S.
Sasaki, Toshikatu: *See*—
Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, 4,190,554, Cl. 252-412.000.
Sasuga, Kazuyasu, to Rank Xerox Limited. Paper feeding system. 4,190,246, Cl. 271-145.000.
Sasuga, Kazuyasu, to Rank Xerox Limited. Apparatus for positioning an original in reproducing machines. 4,190,358, Cl. 355-75.000.
Sato, Yuichi: *See*—
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.
Sauerwein, William D.; and Walton, Richard E., II, to Black & Decker Inc. Brush system for a portable electric tool. 4,190,781, Cl. 310-239.000.
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, to Unit Process Assemblies, Inc. Backscatter instrument having indexing feature for measuring coating thickness of elements on a continuously moving web of substrate material. 4,190,770, Cl. 250-308.000.
Sauter, Charles A., to Bulova Watch Company, Inc. Anti-backlash gear. 4,189,951, Cl. 74-440.000.
Savage, Dennis J.: *See*—
Martin, Thomas W.; Sandhu, Mohammad A.; and Savage, Dennis J., 4,190,446, Cl. 430-25.000.
Sawada, Jiro: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, 4,190,581, Cl. 260-239.100.
Sawada, Kiyoshi; and Yamazaki, Katsuo, to Toshiba Kikai Kabushiki Kaisha. Bidirectional driving mechanism. 4,189,959, Cl. 74-720.000.
Scalzi, Louis M., to New Hampshire Ball Bearings, Inc. Bearing for liner-hanger assembly. 4,190,300, Cl. 308-4.00A.
Schade, Palmer W., II; and Spector, George. Cigarette and cigarette lighter case and cover. 4,190,148, Cl. 206-89.000.
Schaeffer, Ernest. Step motors. 4,190,779, Cl. 310-12.000.
Schaeffer, Robert L.; and Madan, Bhim S., to General Electric Company. Processor and cutter disc. 4,190,208, Cl. 241-92.000.
Schaenzer, Gordon N. Method and apparatus for reloading a centerfire cartridge. 4,189,980, Cl. 86-24.000.
Schaffrin, Carl E., to United States of America, Air Force. Cabinet lock assembly. 4,190,273, Cl. 292-288.000.
Schausberger, Helmut; Geyken, Erwin; and Dawidowitsch, Peter, to AGFA-Gevaert, A.G. Wet-processing apparatus for photographic emulsion carriers with novel disposal of drier-unit exhaust air. 4,189,803, Cl. 15-302.000.
Scheingold, William S.: *See*—
Bright, Edward J.; Cherian, Gabriel B.; and Scheingold, William S., 4,190,310, Cl. 339-45.00R.
Schenke, Walter; and Krauss, Gerhard, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt. Headset. 4,189,788, Cl. 2-209.000.
Schering, A.G.: *See*—
Redemann, Peter, 4,190,002, Cl. 108-50.000.
Schick, Walter H.: *See*—
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.
Schilling, Jan C.; and Gutknecht, James E., to General Electric Company. Windage shield. 4,190,397, Cl. 415-112.000.
Schleier, Waldemar: *See*—
Kraemer, Dieter; Plainer, Hermann; and Schleier, Waldemar, 4,190,713, Cl. 521-149.000.
Schlesinger, David H.: *See*—
Goldstein, Gideon; and Schlesinger, David H., 4,190,646, Cl. 424-177.000.
Goldstein, Gideon; and Schlesinger, David H., 4,190,647, Cl. 424-177.000.
Schlichte, Max; and Neufang, Karlheinz, to Siemens Aktiengesellschaft. Circuit arrangement for receiving and transmitting switching data in telecommunication exchanges. 4,190,740, Cl. 179-15.0AT.
Schliermann, Erich: *See*—
Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, 4,189,813, Cl. 29-156.80R.
Schlumberger Technology Corporation: *See*—
Moulin, Pierre A., 4,190,868, Cl. 360-1.000.
Schmader, Richard W. Method and apparatus for use in frying doughnuts. 4,189,994, Cl. 99-405.000.
Schmerling, Donald W.; and Giacobbe, Frederick, to Chemetron Corporation. Production of carbon monoxide in a plasma arc reactor. 4,190,636, Cl. 423-415.00A.
Schmidhuber, Karl; and Lehmann, Hans D., to Recaro GmbH & Co. Vehicle seats. 4,190,284, Cl. 297-194.000.
Schmidt, Walter, to Swiss Aluminium Ltd. Wheel for air or gas filled tires for motor vehicles. 4,190,297, Cl. 301-63.00R.
Schmitt, Nickolas; Barton, Sterling C.; and Jordan, Lawrence E., to General Electric Company. Current/flow comparator. 4,190,829, Cl. 340-606.000.
Schmitz, Thomas R.; Srivastav, Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., to Brown & Root, Inc. Separable trenching apparatus. 4,190,382, Cl. 405-159.000.
Schneck, Stuart. Hydroponic unit. 4,189,867, Cl. 47-62.000.
Schneider, Abraham: *See*—
Lyons, James E.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,190,611, Cl. 585-361.000.
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,190,610, Cl. 585-361.000.
Schneider, Robert J. Apparatus for use in the construction and decoration of upholstered furniture and the like. 4,190,304, Cl. 312-204.000.
Schnellmann, Ferdinand; and Meier, Hanspeter, to Chemap A.G. Filter element for a rotatable disc filter. 4,190,544, Cl. 210-461.000.
Schnetger, Jochen: *See*—
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, 4,190,613, Cl. 525-215.000.
Schnitzler, Danny L., to Union Carbide Corporation. Packing ring containing flexible graphite. 4,190,257, Cl. 277-102.000.
Schoeller & Co. Elektrotechnische Fabrik GmbH & Co.: *See*—
Seibel, Georg; and Mues, Gunther, 4,190,763, Cl. 219-265.000.
Schoop, Josef; Resch, Werner; and Damme, Heinz, to Stahlwerke Peine-Salzgitter AG. Lance head for a fining lance. 4,190,238, Cl. 266-270.000.
Schrepfer, Hans J.: *See*—
Kiehs, Karl; Schrepfer, Hans J.; and Adolphi, Heinrich, 4,190,650, Cl. 424-204.000.
Schroder, Rolf: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.
Schulmeister, Lee F.: *See*—
Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., 4,190,404, Cl. 425-8.000.
Schulte, Rudolf R., to American Hospital Supply Corporation. Resealable puncture housing for surgical implantation. 4,190,040, Cl. 128-1.00R.
Schultheis, Stephen M., to Coberly & Associates. Constant intensity light source. 4,190,795, Cl. 323-17.000.
Schultz, Herman S.: *See*—
Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., 4,190,718, Cl. 526-207.000.
Schultz, Richard P., to American Optical Corporation. Support for a microscope objective. 4,190,313, Cl. 350-84.000.
Schurter, Rolf: *See*—
Laanio, Verena; Fory, Werner; and Schurter, Rolf, 4,190,433, Cl. 71-100.000.
Schutze, Detlef-Ingo; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Polycyclic dyestuffs. 4,190,726, Cl. 546-27.000.
Schutze, Siegfried; and Locke, Werner, to VEB Pentacon Dresden Kamera- und Kinowerke. Exposure measurement circuit. 4,190,337, Cl. 354-60.00L.
Schwankhart, Gerhard, to Sticht, Walter. Shock absorber assembly and installation. 4,190,239, Cl. 267-65.00R.

Schwind, Adolf-Ernst: *See*—
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Scientific-Atlanta, Inc.: *See*—
Kelly, Jack R., Jr.; and Robinson, Glen P., Jr., 4,190,800, Cl. 325-37.000.

Scotco, Inc.: *See*—
Morrow, Warren P., 4,190,200, Cl. 238-349.000.

Scott Paper Company: *See*—
Kolbach, Charles G.; Niedziejko, Edward M.; and Rizzo, Joseph P., 4,189,896, Cl. 53-431.000.
Taylor, Alfred S., 4,190,345, Cl. 354-318.000.

Scovill Manufacturing Company: *See*—
Robinson, George W., 4,189,855, Cl. 38-82.000.

Sealectro Corporation: *See*—
Iantorno, James, 4,190,308, Cl. 339-19.000.

Sears, Barry D., to Boston University, Trustees of. Kit for determining the level of LDL cholesterol in body fluids. 4,190,628, Cl. 422-61.000.

Seelenbinder, Terry G., to AM International, Inc. Developer transport roll. 4,189,815, Cl. 29-121.800.

Seibel, Georg; and Mues, Gunther, to Schoeller & Co. Elektrotechnische Fabrik GmbH & Co. Electrical cigar lighter for automotive vehicle with snap disc bimetallic switch means. 4,190,763, Cl. 219-265.000.

Seifert, Gunther: *See*—
Johannes, Harald; Seifert, Gunther; Lewer, Hans; and Poller, Dieter, 4,190,292, Cl. 299-12.000.

Seitzer, Walter H., to Suntech, Inc. Catalysts for preparing aromatics from synthesis gas. 4,190,558, Cl. 252-455.00Z.

Seki, Mitsuaki: *See*—
Nozaki, Mineo; and Seki, Mitsuaki, 4,189,997, Cl. 101-93.090.

Sekiya, Fukuo: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,190,892, Cl. 364-711.000.

Seko, Atsuya: *See*—
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.

Seldin, Edward B., to Massachusetts General Hospital. Method of dental surveying. 4,189,835, Cl. 433-214.000.

Semi-Alloys, Inc.: *See*—
Hascoe, Norman, 4,190,176, Cl. 220-359.000.

Semi-Mask, Inc.: *See*—
Alter, David L., 4,189,842, Cl. 33-149.00J.

SemPrex Corporation: *See*—
Volk, Karl G., 4,189,953, Cl. 74-479.000.

Seppi, Edward J.: *See*—
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.

Septier, Louis: *See*—
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.

Sera, Hidefumi; and Horie, Ikutaro, to Fuji Photo Film Co., Ltd. Diffusion transfer photographic material having a crosslinked carboxylic acid polymer layer. 4,190,448, Cl. 430-216.000.

Seragnoli, Enzo, to G. D. Societa per Azioni. Device for checking that the bands joining filters to cigarettes have been sealed down. 4,190,163, Cl. 209-535.000.

Sesser, George L.; and Furtado, Anthony E., to Sperry Rand Corporation. Bale retainer means on a bale wagon. 4,190,391, Cl. 414-39.000.

Seuter, Friedel: *See*—
Boshagen, Horst; Horlein, Ulrich; Meng, Karl-August, deceased; and Seuter, Friedel, 4,190,663, Cl. 424-267.000.

Sever Ezcurra, Jose L.: *See*—
Toro Sosa, German; and Sever Ezcurra, Jose L., 4,190,379, Cl. 404-6.000.

Seward, Thomas P., III: *See*—
Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., 4,190,451, Cl. 106-47.00Q.

Sguazzin, Aldo. Clam rake. 4,190,279, Cl. 294-49.000.

Shaffer, John W.; and Bricker, Daniel W., to GTE Sylvania Incorporated. Photoflash lamp. 4,190,413, Cl. 431-362.000.

Shah, Jagdish K.: *See*—
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., 4,190,390, Cl. 409-198.000.

Shalaby, Shalaby W., to Ethicon, Inc. Isomorphic copolymers of ϵ-caprolactone and 1,5-dioxepan-2-one. 4,190,720, Cl. 528-354.000.

Sharp Kabushiki Kaisha: *See*—
Inoue, Yukihiro, 4,190,855, Cl. 357-80.000.
Washizuka, Isamu; Aoki, Junji; and Tomino, Tadashi, 4,189,912, Cl. 58-152.00R.
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, 4,190,329, Cl. 350-338.000.
Yamamoto, Yoichi; and Shimazawa, Yoichi, 4,190,846, Cl. 346-140.00R.

Sharpe, Thomas R.: *See*—
Cherkofsky, Saul C.; and Sharpe, Thomas R., 4,190,666, Cl. 424-274.000.

Shaull, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., to United States of America, Army. Mine proximity fuse. 4,190,000, Cl. 102-19.200.

Shaver, Noah. Insulation and ventilation system for mobile homes. 4,189,988, Cl. 98-31.000.

Shaw, David G., to General Electric Company. Process for impregnating a capacitor with a non-halogenated impregnant. 4,190,682, Cl. 427-79.000.

Sheffer, Timothy K., to General Motors Corporation. Carburetor. 4,190,618, Cl. 261-50.00R.

Shell Oil Company: *See*—
Brokken-Zijp, Josephina C. M.; and Reinders, Foppe J., 4,190,705, Cl. 429-111.000.
De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., 4,190,462, Cl. 134-2.000.

Sheller-Globe Corporation: *See*—
Brubaker, James E., 4,189,956, Cl. 74-501.00M.

Sherman, Allan P., to Hewlett-Packard Company. Derivation of steady values of blood pressures. 4,190,886, Cl. 364-415.000.

Sherman & Reilly, Inc.: *See*—
Chadwick, William H., Jr., 4,189,828, Cl. 29-762.000.

Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, to Dainichi-Nippon Cables, Ltd.; and Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for deicing of trolley wires. 4,190,137, Cl. 191-27.000.

Shimada, Junichi: *See*—
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.

Shimadzu, Hiroshi: *See*—
Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,190,656, Cl. 424-251.000.

Shimanaka, Hiroshi: *See*—
Ichida, Toshio; Komatsubara, Michiro; and Shimanaka, Hiroshi, 4,190,469, Cl. 148-113.000.

Shimano Industrial Company, Limited: *See*—
Nakamura, Yoshihiko; and Nagano, Masashi, 4,189,954, Cl. 74-488.000.

Shimazawa, Yoichi: *See*—
Yamamoto, Yoichi; and Shimazawa, Yoichi, 4,190,846, Cl. 346-140.00R.

Shintaku, Keiichi, to Nippon Electric Co., Ltd. Method of manufacturing an internal mirror type gas laser tube. 4,190,511, Cl. 204-192.00P.

Shionogi & Co., Ltd.: *See*—
Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, 4,190,728, Cl. 560-168.000.

Shirayama, Shimpey: *See*—
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, 4,190,771, Cl. 250-385.000.

Shiroki, Hiroyuki: *See*—
Ogawa, Shinsaku; Yoshida, Mitsuo; and Shiroki, Hiroyuki, 4,190,505, Cl. 204-98.000.

Shure Manufacturing Corporation: *See*—
Richardson, Daniel E., 4,190,004, Cl. 109-19.000.

Siegmund, Walter P., to American Optical Corporation. Line illuminator. 4,190,347, Cl. 355-1.000.

Siemens Aktiengesellschaft: *See*—
Brabetz, Bernhard; and Hackl, Helmut, 4,190,386, Cl. 408-1.00R.
Frank, Richard J., 4,190,744, Cl. 179-18.0BC.
Krause, Gerhard, 4,190,778, Cl. 307-254.000.
Schlichte, Max; and Neufang, Karlheinz, 4,190,740, Cl. 179-15.0AT.
Southard, Gary D., 4,190,742, Cl. 179-18.0BC.
Tihanyi, Jenoe; and Bell, Guido, 4,190,850, Cl. 357-23.000.

SIG-Schweizerische Industrie-Gesellschaft: *See*—
Knuchel, Max, 4,190,146, Cl. 198-460.000.

Sigwald, Jacques; and Achard, Michel, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Devices for re-cycling the exhaust gases of an internal combustion engine. 4,190,031, Cl. 123-119.00A.

Silbernagel, Bernard G.: *See*—
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,190,706, Cl. 429-191.000.

Silberzahn, Hermann: *See*—
Goringer, Hans; Kelly, Thomas R.; Ries, Dieter; and Silberzahn, Hermann, 4,190,676, Cl. 426-100.000.

Silver, Stanley M., to Paxall Inc. Method and apparatus for heat sealing a package blank. 4,189,986, Cl. 93-36.00M.

Silverwood, Colin, to British Screw Company Limited. Fastener for securing and sealing sheet material in spaced relation to a support. 4,189,979, Cl. 85-74.000.

Simes Societa Italiana Medicinali e Sintatici S.p.A.: *See*—
Gherardi, Paolo; and Ferrari, Giorgio, 4,190,654, Cl. 424-244.000.

Singer Company, The: *See*—
Cameron, Albert R.; and Gneiding, Donald R., 4,190,076, Cl. 137-505.450.
Friedland, Bernard, 4,189,947, Cl. 74-5.500.
Hoffman, Jay; and Ferriss, Lincoln S., 4,189,946, Cl. 74-5.400.
Ljung, Bo H. G.; and Gamertsfelder, George R., 4,190,364, Cl. 356-350.000.
Stahle, Howard L.; and Grossman, Norman R., 4,190,831, Cl. 340-707.000.

Singrey, Raymond E. Chip drying and cleaning device. 4,190,415, Cl. 432-58.900.

Sinnreich, Manfred. Surgical retractor for endoscopes. 4,190,042, Cl. 128-20.000.

Sirasawa, Minoru: *See*—
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, 4,190,454, Cl. 106-90.000.

Siu, Patrick M. Anti-drug withdrawal syndrome composition and method of use. 4,190,660, Cl. 424-258.000.

Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., to Alcan Research and Development Limited. Continuous casting of metal strip between moving belts. 4,190,103, Cl. 165-120.000.
Skala, Stephen F. Vehicle system for NaK-water-air internal combustion engines. 4,189,916, Cl. 60-311.000.
Ski Tree, Inc.: *See*
Hickey, Dana, 4,190,182, Cl. 224-45.00S.
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., to Institut Kibernetiki Akademii Nauk Ukrainskoi S S R. Digital device for determining carbon content in iron-carbon melts. 4,190,888, Cl. 364-497.000.
Slack, Otto G. Template pattern alignment. 4,189,820, Cl. 29-425.000.
Sloan, Albert H. Integral pump and drive shaft assembly. 4,190,400, Cl. 415-170.00A.
Sloan-Kettering Institute for Cancer Research: *See*—
Goldstein, Gideon; and Schlesinger, David H., 4,190,646, Cl. 424-177.000.
Goldstein, Gideon; and Schlesinger, David H., 4,190,647, Cl. 424-177.000.
Slonicki, Alex. Automated system for the application of coverglasses on histological and cytological slides. 4,190,472, Cl. 156-57.000.
Smart, William L.; and Hoenig, Stuart A., to Ritten Corporation, Ltd., The. Apparatus for removing particulate matter from an atmosphere. 4,190,875, Cl. 361-228.000.
Smith, Andrew J. Dental reinforcing pins. 4,189,834, Cl. 433-225.000.
Smith, Anthony M.: *See*—
Kulik, Stanley; and Smith, Anthony M., 4,190,546, Cl. 252-49.600.
Smith, Craig A.; and Guenther, Joachim, to Xerox Corporation. Copier job recovery system. 4,190,354, Cl. 355-3.0SH.
Smith, David L.: *See*—
Smith, Dwight H.; and Smith, David L., 4,190,899, Cl. 364-900.000.
Smith, Dennis W.: *See*—
Hares, George B.; Morse, David L.; Seward, Thomas P., III; and Smith, Dennis W., 4,190,451, Cl. 106-47.00Q.
Smith, Derek R., to Union Carbide Corporation. Method of producing a joint capable of transmitting high torque. 4,190,479, Cl. 156-294.000.
Smith, Dwight H.; and Smith, David L., to Computer Microfilm International Corporation. Card retrieval device. 4,190,899, Cl. 364-900.000.
Smith, Frank T. J., to Eastman Kodak Company. Silicon charge-handling device employing SiC electrodes. 4,189,826, Cl. 29-590.000.
Smith, George T. Self-contained clamp-mounted pivotal arm mailbox signal device assembly. 4,190,193, Cl. 232-35.000.
Smith, Harlan B., to Erickson Air Crane Co. Angle guide apparatus. 4,189,892, Cl. 52-749.000.
Smith, Harry D., Jr.: *See*—
Arnold, Dan M.; and Smith, Harry D., Jr., 4,190,768, Cl. 250-270.000.
Smith, Jay C.; Manuel, Ronald J.; and McAllister, James E., to Freeport Minerals Company. Crud handling circuit. 4,190,633, Cl. 423-321.00S.
Smith, John L.: *See*—
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.
Smith, Kenneth C.: *See*—
Armond, John W.; Webber, David A.; and Smith, Kenneth C., 4,190,424, Cl. 55-58.000.
Smith & Nephew Research Ltd.: *See*—
Hodgson, Martin E.; Munro, Graham D.; Rickman, David P.; and Fennimore, Jack, 4,190,542, Cl. 210-282.000.
SmithKline & French Laboratories Limited: *See*—
Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, 4,190,664, Cl. 424-270.000.
Snamprogetti S.p.A.: *See*—
Bellofatto, Oreste, 4,189,922, Cl. 60-641.000.
Snezhnoi, Rostislav L.: *See*—
Teplinsky, Anatoly D.; Ryvkis, Yakov M.; Snezhnoi, Rostislav L.; and Netes, Leonid Y., 4,190,096, Cl. 164-158.000.
Societe Anonyme Automobiles Citroen: *See*—
Sigwald, Jacques; and Achard, Michel, 4,190,031, Cl. 123-119.00A.
Societe Anonyme de Telecommunications: *See*—
Cointot, Denis F., 4,190,741, Cl. 179-15.0BS.
Dubrunfaut, Gerard H., 4,190,361, Cl. 356-5.000.
Dubrunfaut, Gerard H., 4,190,362, Cl. 356-5.000.
Societe Anonyme Dite: Ceraver: *See*—
Warnet, Henri; and Fouinat, Paul, 4,190,736, Cl. 174-209.000.
Societe Anonyme Dite: La Telephonie Industrielle et Commerciale-Telic: *See*—
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.
Societe Anonyme Francaise du Ferodo: *See*—
Berlioux, Jacques, 4,190,142, Cl. 192-106.200.
Societe Anonyme Roure Bertrand Dupont: *See*—
Auger, Bernard; Plattier, Marcel; and Teisseire, Paul J., 4,190,561, Cl. 252-522.00R.
Societe Francaise d'Electrometallurgie "Sofrem": *See*—
Bonfils, Rene; Mena, Andre; Payn, Christian; and Septier, Louis, 4,190,434, Cl. 75-10.00R.
Societe Hygiaphone V.B.: *See*—
Bourlier, Claude, 4,190,003, Cl. 109-19.000.
Societe Industrielle Bertrand Faure: *See*—
Letournoux, Alain; and Droual, Rene, 4,190,226, Cl. 248-429.000.
Societe Nationale elf Aquitaine: *See*—
Despois, Jacques; and Nougarede, Francis, 4,190,099, Cl. 165-45.000.
Societe Nouvelle de Roulements: *See*—
Chalansonnet, M. Roger, 4,189,816, Cl. 29-148.40C.
Societe Nouvelle des Echafaudages Tubulaires Mills: *See*—
Beziat, Bernard, 4,189,810, Cl. 24-249.00R.
Soda, Atsuhiko: *See*—
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.
Soecknick, Erhard; and Weimar, Erich, to Messer Griesheim GmbH. Process for accelerating the hardening of joints glued with crystalline hardening adhesives. 4,190,473, Cl. 156-80.000.
Sokolov, Sergei S.: *See*—
Podboronov, Boris P.; Sokolov, Sergei S.; and Furman, Anatoly V., 4,190,776, Cl. 307-112.000.
Solvay & Cie.: *See*—
Alard, Joseph; and Derroitte, Jean-Louis, 4,190,624, Cl. 264-146.000.
Somers, Frank J.; and Winslow, John S., to MCA Discovision, Inc. Digital method and apparatus for rotating an information storage disk. 4,190,860, Cl. 358-128.500.
Someshwar, Ashok H., to Texas Instruments Incorporated. Binary coded decimal addressed Read-Only-Memory. 4,190,897, Cl. 364-900.000.
Son, Pyong N.: *See*—
Lai, John T.; and Son, Pyong N., 4,190,571, Cl. 260-45.80N.
Sone, Hisao: *See*—
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.
Sonntag, Paul A., to Western Electric Company, Incorporated. Industrial scissors. 4,189,831, Cl. 30-232.000.
Sony Corporation: *See*—
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.
Ikeda, Jiro, 4,190,503, Cl. 204-5.000.
Sotchenko, Vladimir P.: *See*—
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Sotos, Juan N., to Repla International S.A.H. Fastener device and method of manufacturing. 4,189,809, Cl. 24-204.000.
Southard, Gary D., to Siemens Aktiengesellschaft. Process and apparatus for producing conference connections in a PCM time multiplex switching system. 4,190,742, Cl. 179-18.0BC.
Special Metals Corporation: *See*—
Boesch, William J.; and Maurer, Gernant E., 4,190,437, Cl. 75-122.000.
Spector, George: *See*—
Schade, Palmer W., II; and Spector, George, 4,190,148, Cl. 206-89.000.
Speno International S.A.: *See*—
Panetti, Romolo, 4,189,873, Cl. 51-178.000.
Sperry Corporation: *See*—
Buckley, Charles G.; and Kiedrowski, James A., 4,189,948, Cl. 74-5.460.
Farnsworth, David L.; and Thomas, Ronald E., 4,190,898, Cl. 364-900.000.
Sperry Rand Corporation: *See*—
Butler, L. Dennis, 4,190,392, Cl. 414-39.000.
Sesser, George L.; and Furtado, Anthony E., 4,190,391, Cl. 414-39.000.
Spiller, Clifford M. Interlocking screen elements. 4,190,527, Cl. 209-363.000.
Spitz, George T.: *See*—
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,714, Cl. 525-163.000.
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,190,715, Cl. 525-163.000.
Spodig, Heinrich. Permanent magnetic separator for liquids. 4,190,540, Cl. 210-222.000.
Spong, Fred W., to RCA Corporation. Recording methods for a multilayer optical record. 4,190,843, Cl. 346-1.100.
Spring, David J.: *See*—
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,190,643, Cl. 424-54.000.
Srivastav, Avadhesh N. L.: *See*—
Schmitz, Thomas R.; Srivastav, Avadhesh N. L.; Lochridge, Joe C.; and Morgan, William A., 4,190,382, Cl. 405-159.000.
Staalkat B.V.: *See*—
van der Schoot, Jelle, 4,189,849, Cl. 34-33.000.
Stadler, Peter: *See*—
Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., 4,190,722, Cl. 536-17.00R.
Stahl, Harold M.: *See*—
Ariotti, Robert C.; Stahl, Harold M.; and Clifford, Lawrence E., 4,190,018, Cl. 118-690.000.
Stahle, Howard L.; and Grossman, Norman R., to Singer Company, The. Light pen detection system for CRT image display. 4,190,831, Cl. 340-707.000.
Stahlwerke Peine-Salzgitter AG: *See*—
Schoop, Josef; Resch, Werner; and Damme, Heinz, 4,190,238, Cl. 266-270.000.

Stamicarbon, B.V.: *See—*
Bijen, Jan M. J. M.; and Kleinjans, Peter A. M., 4,190,455, Cl. 106-98.000.
Dassen, Bernardus H. N., 4,190,528, Cl. 210-8.000.
Geus, John W.; and Hermans, Leonardus A. M., 4,190,560, Cl. 252-459.000.
Standard Oil Company: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,190,556, Cl. 252-432.000.
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,190,608, Cl. 260-604.00R.
Standard Oil Company (Ohio): *See—*
Landis, Norris J., 4,190,622, Cl. 264-14.000.
Stanford Research Institute International: *See—*
Crane, Hewitt D.; and Wolf, Daniel E., 4,190,820, Cl. 340-146.3SG.
Stansbury, Benjamin, to American Hospital Supply Corporation. Highly stretchable glove and form for making same. 4,189,787, Cl. 2-163.000.
Starchenko, Vitaly S.: *See—*
Bizik, Nikolai K.; Frumin, Isidor I.; Sotchenko, Vladimir P.; Barabash, Valery F.; Chernyak, Petr F.; Frumin, Evgeny I.; Asoiants, Grigory B.; Kulesha, Vadim A.; Golomazov, Viktor A.; Ibragimov, Dias A.; Kozhevnikov, Nikolai I.; Chernenko, Nikolai P.; Starchenko, Vitaly S.; and Kalosha, Alexei S., 4,190,017, Cl. 118-74.000.
Stasiewicz, John: *See—*
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.
Stebbings, David W.: *See—*
Harwood, Hugh D.; Pao, Joseph Y. C.; and Stebbings, David W., 4,190,746, Cl. 179-115.50R.
Stecklein, Gary L., to Deere & Company. Articulated joint including Belleville spring seals maintained in preselected compressed state. 4,190,378, Cl. 403-146.000.
Steele, Bobby C.; Barr, Douglas R.; Hunt, Charles T.; and Ayres, James L., to Gold Kist, Incorporated. Low fat peanut flour prepared by solvent extraction of oil from peanut flakes. 4,190,577, Cl. 260-123.500.
Steer, David E.: *See—*
Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., 4,190,103, Cl. 165-120.000.
Steiniger, Wolfgang: *See—*
Heitmann, Uwe; Steiniger, Wolfgang; Holznagel, Uwe; Kaebernick, Hartmut; Pfannmuller, Joachim; and Reuland, Joachim, 4,190,061, Cl. 131-21.00B.
Stele, Aaron. Dental jaw simulator. 4,189,837, Cl. 433-57.000.
Stendel, Wilhelm: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,190,652, Cl. 424-222.000.
Stenudd, Sven G. V., to Facit Aktiebolag. Stray ink collector for impact printer. 4,190,847, Cl. 346-141.000.
Stephen, Robert L.: *See—*
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.
Stephenson, Robert L., to Allied Chemical Corporation. Passive seat belt system. 4,190,267, Cl. 280-803.000.
Sterzer, Fred, to RCA Corporation. Apparatus and method for hyperthermia treatment. 4,190,053, Cl. 128-399.000.
Stevens, Everett E.: *See—*
Moss, Gerald E.; and Stevens, Everett E., 4,190,816, Cl. 333-131.000.
Stewart, Olivia D.: *See—*
Eckert, Lewis W.; and Stewart, Olivia D., 4,190,492, Cl. 162-145.000.
Stewart, William F.; and Baldwin, Charles W. Process for growing sprouts. 4,189,865, Cl. 47-14.000.
Sticht, Walter: *See—*
Schwankhart, Gerhard, 4,190,239, Cl. 267-65.00R.
Stiebitz, Paul H.: *See—*
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.
Stiefel, Frank J., to Carter-Wallace, Inc. Method for the preparation of 2,3-dimethyl-pent-4en-aldehyde. 4,190,607, Cl. 260-601.00R.
Stiegler, Erwin: *See—*
Ostermann, Gerd; Stiegler, Erwin; Schliermann, Erich; and Hirsch, Peter, 4,189,813, Cl. 29-156.80R.
Stock Equipment Company: *See—*
Dillon, Glenn W.; and Lindell, Albert H., 4,189,824, Cl. 29-522.00R.
Stock, Thomas A. C.: *See—*
Sivilotti, Olivo G.; Steer, David E.; and Stock, Thomas A. C., 4,190,103, Cl. 165-120.000.
Stolle, Herbert D.: *See—*
Bruenig, Matthias M.; and Stolle, Herbert D., 4,190,289, Cl. 297-391.000.
Stoneleigh Trust, Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees, The: *See—*
Massa, Frank, 4,190,783, Cl. 310-324.000.
Massa, Frank, 4,190,784, Cl. 310-324.000.
Stopler, Leonid M.: *See—*
Davydov, Anatoly B.; Korsakov-Bogatkov, Sergei M.; Krakovsky, Boris D.; Nikitkin, Vasily D.; Onosovsky, Evgeny V.; Pronko, Vladimir G.; Stopler, Leonid M.; Chernyshev, Boris A.; and Antipenkov, Boris A., 4,189,930, Cl. 62-502.000.
Strachan, John B., to Domino Equipment Pty. Ltd. Emission control apparatus for diesel engines. 4,190,629, Cl. 422-169.000.
Strand, Glen O.: *See—*
Muench, Wayne C.; Strand, Glen O.; and Hormel, Thad S., 4,190,605, Cl. 260-600.00R.
Strecker, Johannes: *See—*
Hahn, Karl; Bohms, Herbert; Strecker, Johannes; and Landes, Wilhelm, 4,190,220, Cl. 246-182.00B.
Strien, Werner, to Recaro GmbH & Co. Headrest for vehicle seats. 4,190,290, Cl. 297-408.000.
Stroup, Steven L.; and Harman, Galen B., to Burr Oak Tool & Gauge Company. Apparatus for filling heating tube. 4,190,407, Cl. 425-110.000.
Su, Stephen C.: *See—*
Finnila, Ronald M.; and Su, Stephen C., 4,190,851, Cl. 357-30.000.
Suchanek, Borivoj: *See—*
Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, 4,190,067, Cl. 139-435.000.
Suda, Seiji: *See—*
Inui, Tomoji; Mori, Yasunori; Suda, Seiji; and Furuhashi, Toshio, 4,190,027, Cl. 123-117.00R.
Sugai, Hiroshi; and Ogawa, Haruo, to Kabushiki Kaisha Morita Seisakusho. Chuck for dental hand-piece. 4,189,836, Cl. 433-127.000.
Sugimori, Shiro, to Nippon Kogaku K.K. Motor drive device for camera. 4,190,341, Cl. 354-173.000.
Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, to Sumitomo Chemical Company, Limited. Method for treating leather. 4,190,687, Cl. 427-389.000.
Sugiyama, Terumasa: *See—*
Murayama, Yuichi; and Sugiyama, Terumasa, 4,190,359, Cl. 355-75.000.
Sulzer Brothers Limited: *See—*
Frei, Arno, 4,190,104, Cl. 165-162.000.
Yee, Kim S., 4,190,493, Cl. 176-60.000.
Sumitomo Chemical Company, Limited: *See—*
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,190,699, Cl. 428-412.000.
Sugiura, Takahisa; Abeta, Sadaharu; Kato, Takashi; and Hotta, Hiroshi, 4,190,687, Cl. 427-389.000.
Sumitomo Electric Industries, Ltd.: *See—*
Takeda, Kazutoki; Negishi, Yasuo; and Hibino, Yutaka, 4,190,485, Cl. 156-583.900.
Sun Oil Company of Pennsylvania: *See—*
Lyons, James E.; Myers, Harry K., Jr.; and Schneider, Abraham, 4,190,611, Cl. 585-361.000.
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,190,610, Cl. 585-361.000.
Suntech, Inc.: *See—*
Cassar, Richard D., 4,190,460, Cl. 106-287.320.
Seitzer, Walter H., 4,190,558, Cl. 252-455.00Z.
Supraton F. J. Zucker KG: *See—*
Zucker, Friedrich J.; and Langenbusch, Hans J., 4,190,373, Cl. 366-160.000.
Suresh, Dev D.: *See—*
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,190,556, Cl. 252-432.000.
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,190,608, Cl. 260-604.00R.
Suzuki, Akira: *See—*
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, 4,190,396, Cl. 415-110.000.
Suzuki, Masayuki: *See—*
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, to Nitto Chemical Industry Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Process for producing polymer from quaternized acrylate monomer. 4,190,717, Cl. 526-62.000.
Svendsen, Lars G., to Pentapharm A.G. Substrate for the quantitative determination of plasminogen activators. 4,190,574, Cl. 260-112.50R.
Swakopmund AG: *See—*
Hartmann, Werner, 4,190,101, Cl. 165-82.000.
Swanson, Kenneth R.; and Beilfuss, Richard J., to Aeroquip Corporation. Bracing strut for flexible conduits. 4,190,223, Cl. 248-68.00R.
Swanson, Roy E., Jr.: *See—*
Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., 4,190,107, Cl. 166-120.000.
Swarbrick, Richard, to Honeywell Inc. Current telemetering interface apparatus. 4,190,822, Cl. 340-210.000.
Sweeney, Lawrence J., to Franklin Steel Company. Drive cap. 4,190,118, Cl. 173-130.000.
Swift Canadian Co., Limited: *See—*
Van Heyningen, Woeldrik P., 4,189,806, Cl. 17-52.000.
Swift, Harold E.: *See—*
Giannetti, Joseph P.; and Swift, Harold E., 4,190,518, Cl. 208-8.0LE.
Swiss Aluminium Ltd.: *See—*
Schmidt, Walter, 4,190,297, Cl. 301-63.00R.
Sylvester, Robert A.: *See—*
Coil, Michael K.; and Sylvester, Robert A., 4,190,447, Cl. 430-214.000.
Synthelabo: *See—*
Koletar, Gabor I.; Najer, Henry; LeFevre, Jean P. G.; Dupont, Regis; Giudicelli, Don Pierre R. L.; and Morel, Claude C. H., 4,190,657, Cl. 424-256.000.

Syva Company: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,190,496, Cl. 435-7.000.
Szarvasi, Etienne; and Festal, Didier, to Lipha, Lyonnaise Industrielle Pharmaceutique. Substituted arylaliphatic acids. 4,190,665, Cl. 424-274.000.
Tabel, Johannes: *See—*
Kluczynski, Achim; and Tabel, Johannes, 4,190,216, Cl. 242-194.000.
Tachibana, Seiji: *See—*
Kojima, Masaharu; Sone, Hisao; Ogawa, Hiroshi; Nakazawa, Nobuhiko; and Tachibana, Seiji, 4,190,593, Cl. 260-397.450.
Taisho Pharmaceutical Co., Ltd.: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, 4,190,581, Cl. 260-239.100.
Taitel, Charles M.: *See—*
Ryan, Ralph L.; and Taitel, Charles M., 4,190,483, Cl. 156-504.000.
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, to Takenaka Komuten Co., Inc. Apparatus for treatment of sludge deposit. 4,190,372, Cl. 366-141.000.
Takahashi, Teruomi; and Matsuo, Takehiko, to Canon Kabushiki Kaisha. Electrophotographic photosensitive medium and process for manufacturing thereof. 4,190,445, Cl. 430-66.000.
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, to Mitsui Toatsu Chemicals, Incorporated. Catalyst system for polymerizing alpha-olefins and method of making same. 4,190,555, Cl. 252-429.00B.
Takeda Chemical Industries, Ltd.: *See—*
Hashimoto, Naoto; and Kishi, Toyokazu, 4,190,580, Cl. 260-239.30P.
Matsumura, Koichi; Miyashita, Osamu; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,190,656, Cl. 424-251.000.
Takeda, Kazutoki; Negishi, Yasuo; and Hibino, Yutaka, to Sumitomo Electric Industries, Ltd. Method of welding a thermoshrinkable sheet and a device for use in the method. 4,190,485, Cl. 156-583.900.
Takenaka Komuten Co., Inc.: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miura, Mitsuo; Mizuhata, Teruo; Ito, Takefumi; Miyaguchi, Masao; and Kawamura, Tateo, 4,190,372, Cl. 366-141.000.
Takeuchi, Tomio: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.
Talbert, Stephen B.: *See—*
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen B., 4,190,749, Cl. 200-11.0TW.
Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, to Mezogazdasagi Foiskola, Kaposvar. Process and equipment for machine milking to provide sterile milk free from blood and pus. 4,190,020, Cl. 119-14.080.
Tamura, Hidemasa: *See—*
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.
Tankred, Hans J.; and Kristensen, Erling B., to Danfoss A/S. Piston-cylinder arrangement for a compressor. 4,189,984, Cl. 92-82.000.
Taplin, Lael B., to Bendix Corporation, The. Control of EGR in a closed loop EFI engine. 4,190,029, Cl. 123-119.00A.
Tappe, Horst, to Cassella Aktiengesellschaft. Substituted pyridines and process for making them. 4,190,723, Cl. 542-422.000.
Tapper, Robert; Diamond, Arthur S.; and Arora, Ajit S., to General Medical Company. Method and means for recording sweat gland activity. 4,190,056, Cl. 128-630.000.
Tashma, Zeav: *See—*
Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, 4,190,664, Cl. 424-270.000.
Tawata, Shinkichi: *See—*
Eto, Morifusa; Tawata, Shinkichi; and Oshima, Kohei, 4,190,651, Cl. 424-209.000.
Taylor, Alfred S., to Scott Paper Company. Lithographic plate processing apparatus. 4,190,345, Cl. 354-318.000.
Taylor, Paul D.: *See—*
Vanderspurt, Thomas H.; and Taylor, Paul D., 4,190,620, Cl. 261-148.000.
Taylor, Samuel K.: *See—*
Braden, Arthur B.; Kuwik, John J.; Taylor, Samuel K.; and Covic, John, 4,190,773, Cl. 250-445.00T.
Taylor, Terrence F. E., to International Standard Electric Corporation. Ink-jet printer with pneumatic deflector. 4,190,844, Cl. 346-75.000.
Taylor, Thomas L.: *See—*
Terry, Robert G., 4,190,124, Cl. 175-406.000.
Teisseire, Paul J.: *See—*
Auger, Bernard; Plattier, Marcel; and Teisseire, Paul J., 4,190,561, Cl. 252-522.00R.
Tektronix, Inc.: *See—*
Basta, Thomas P., 4,190,311, Cl. 339-75.0MP.
Doornink, Douglas J., 4,190,834, Cl. 340-709.000.
Teledyne Industries, Inc.: *See—*
Fienhold, Stephen C.; and Cammack, Michael A., 4,190,207, Cl. 239-381.000.
Telex Communications, Inc.: *See—*
Guess, Joe F., 4,190,782, Cl. 310-324.000.
Tengzelius, Jan R.; and Fayles, Robert R., to Hoganas AB Fack. Powder intended for powder metallurgical manufacturing of soft magnetic components. 4,190,441, Cl. 75-251.000.
Tenud, Leander, to Lonza Ltd. Process for the production of indolyl lactic acid. 4,190,585, Cl. 260-326.13R.
Teplinsky, Anatoly D.; Ryvkis, Yakov M.; Snezhnoi, Rostislav L.; and Netes, Leonid Y. Manipulator for separating coated permanent moulds. 4,190,096, Cl. 164-158.000.
Teramura, Satoshi: *See—*
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, 4,190,329, Cl. 350-338.000.
Terlecky, Boris S.: *See—*
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., 4,190,390, Cl. 409-198.000.
Terry, Robert G., to Taylor, Thomas L. Stabilizer and blade attachment means therefor. 4,190,124, Cl. 175-406.000.
Teschner, Wolfgang; and Bierbaum, Dieter, to Carl Still, Firma. System to acquire and monitor operating machinery positions for horizontal coke oven batteries. 4,190,498, Cl. 202-262.000.
Texaco Inc.: *See—*
Arnold, Dan M.; and Smith, Harry D., Jr., 4,190,768, Cl. 250-270.000.
Texas Instruments Incorporated: *See—*
Marum, Steven E., 4,189,909, Cl. 58-23.00R.
Someshwar, Ashok H., 4,190,897, Cl. 364-900.000.
Thate, Kurt, to AGFA-Gevaert, A.G. Arrangement for transporting photographic film, and the like. 4,190,185, Cl. 226-172.000.
Thermo-Seal, Inc.: *See—*
Haimowitz, Irwin, 4,190,174, Cl. 220-254.000.
Thiokol Corporation: *See—*
Ellerstein, Stuart M., 4,190,625, Cl. 264-176.00R.
Thomas, Ronald E.: *See—*
Farnsworth, David L.; and Thomas, Ronald E., 4,190,898, Cl. 364-900.000.
Thompson, Harold L.: *See—*
Beusch, Glenn A.; Thompson, Harold L.; Lindner, Herbert E.; and Jones, Geoffrey G., 4,190,068, Cl. 137-1.000.
Thompson, Terry D. Massage table drive system. 4,190,043, Cl. 128-33.000.
Thomson, Alan R.; and Miles, Brynley J., to United Kingdom Atomic Energy Authority. Separation of macromolecules. 4,190,576, Cl. 260-122.000.
Thomson-CSF: *See—*
Salvaudon, Laurence; and Charlot, Jean-Claude, 4,190,837, Cl. 343-16.00M.
Thoratec Laboratories Corporation: *See—*
Hill, J. Donald; Harvey, Robert J.; and Downie, David E., 4,190,057, Cl. 128-675.000.
Thormer, Joachim; Schnetger, Jochen; Giersiepen, Gerhard; and Gobel, Wilhelm, to Bayer Aktiengesellschaft. Separating agent for rubber powders. 4,190,613, Cl. 525-215.000.
Thorpe, Laurence J.: *See—*
Dischert, Robert A.; and Thorpe, Laurence J., 4,190,863, Cl. 358-210.000.
Tideland Signal Corporation: *See—*
Luce, Dan G.; Klein, William R.; and Krenke, Richard D., 4,190,777, Cl. 307-139.000.
Tiep, Brian L., to City of Hope National Medical Center. Variable capacitors. 4,190,876, Cl. 361-278.000.
Tihanyi, Jenoe; and Bell, Guido, to Siemens Aktiengesellschaft. MIS field effect transistor having a short channel length. 4,190,850, Cl. 357-23.000.
Tinholt, Thomas H.; and Konkle, Phillip E., to Eaton Corporation. Centering abutment for viscous fluid drive. 4,190,139, Cl. 192-58.00B.
Tinholt, Thomas H.: *See—*
Konkle, Phillip E.; and Tinholt, Thomas H., 4,190,140, Cl. 192-82.00T.
Tissot, Pierre L. Plastic chassis with magnetic holding means for electronic components. 4,190,879, Cl. 361-386.000.
Titeflex Corporation: *See—*
Lalikos, James M.; Gazda, Chester T.; and O'Melia, Lawrence, 4,190,088, Cl. 138-126.000.
TMC Corporation: *See—*
Himmetsberger, Alois; and Wittmann, Heinz, 4,190,264, Cl. 280-618.000.
Tobin-Arp Manufacturing Company: *See—*
Peterson, Bertil G., 4,190,240, Cl. 269-21.000.
Todd, Maurice C.: *See—*
Agers, Brian M.; and Todd, Maurice C., 4,189,812, Cl. 28-272.000.
Tokai Seiki Co., Ltd.: *See—*
Nitta, Tomio, 4,190,412, Cl. 431-151.000.
Tokiwa Industrial Co., Ltd.: *See—*
Kabashima, Ryuichi, 4,190,126, Cl. 175-410.000.
Tokuyama Soda Kabushiki Kaisha: *See—*
Kajimaya, Yoshihisa; Kojima, Takahide; Murakami, Yoshio; and Matsuura, Shunji, 4,190,516, Cl. 204-290.00R.
Matsuura, Shunji; Oku, Toshio; Kurumatani, Masaaki; Kuramoto, Nobuyuki; and Ozaki, Yasutaka, 4,190,514, Cl. 204-242.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kamei, Hisashi; Shirayama, Shimpey; Nakakita, Tsuneo; Murata, Moriyoshi; and Kikuchi, Yushichi, 4,190,771, Cl. 250-385.000.
Kanno, Ken-ichi; Suzuki, Masayuki; Sato, Yuichi; and Machida, Masamichi, 4,190,502, Cl. 204-1.00T.
Tokyo Shibaura Electric Company, Limited: *See—*
Ishii, Akira, 4,190,796, Cl. 323-75.00N.
Tolmunen, Arvi: *See—*
Hasa, Juhani; and Tolmunen, Arvi, 4,190,085, Cl. 138-45.000.
Tom McGuane Industries, Inc.: *See—*
Ludwig, George C., 4,189,981, Cl. 91-52.000.

Tomczak, Roman M.: *See—*
Ailey, Harrison A., Jr.; Andre, L. George; and Tomczak, Roman M., 4,189,897, Cl. 53-434.000.
Tominaga, Akira; and Hirata, Yasuyuki, to Kansai Paint Company, Limited. Cationic electrophoretic coating compositions. 4,190,564, Cl. 260-18.0PT.
Tomino, Tadashi: *See—*
Washizuka, Isamu; Aoki, Junji; and Tomino, Tadashi, 4,189,912, Cl. 58-152.00R.
Tomioka, Shunzo; Nakano, Masaaki; Suzuki, Akira; and Sakamoto, Shizuichi, to Hitachi, Ltd. Sodium turbine pump. 4,190,396, Cl. 415-110.000.
Tomlinson, George H., II, to Domtar Inc. Impregnation and digestion of wood chips. 4,190,490, Cl. 162-19.000.
Tomy Kogyo Co., Inc.: *See—*
Saito, Makoto, 4,189,864, Cl. 46-202.000.
Tonai, Koichi: *See—*
Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, 4,190,276, Cl. 293-133.000.
Tondreau, Raymond A.; and Bray, Donald T., to Desalination Systems, Inc. Water storage control for reverse osmosis system. 4,190,537, Cl. 210-98.000.
Toray Industries, Inc.: *See—*
Fujita, Saburo; Motegi, Masahiko; Okamoto, Satoru; Soda, Atsuhiko; and Inoue, Masakazu, 4,190,689, Cl. 428-20.000.
Torffield, Marvin. High-fidelity stereo sound system. 4,190,739, Cl. 179-1.0GA.
Torny-Schutte, Gerridina J.: *See—*
De Jong, Reike; Torny-Schutte, Gerridina J.; and Reinhoudt, David N., 4,190,462, Cl. 134-2.000.
Toro Sosa, German; and Sever Ezcurra, Jose L. Device for reserving individual parking areas. 4,190,379, Cl. 404-6.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Kimura, Koya; Machi, Shinji; and Manabe, Takao, 4,190,007, Cl. 112-121.120.
Sawada, Kiyoshi; and Yamazaki, Katsuo, 4,189,959, Cl. 74-720.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, 4,190,506, Cl. 204-98.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Etoh, Kunihiko; Owa, Kaoru; and Nakashima, Kunimichi, 4,190,889, Cl. 364-474.000.
Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, 4,189,963, Cl. 74-821.000.
Tra, Josef, to J. M. Voith GmbH. Apparatus for purifying a suspension of fibrous material. 4,190,522, Cl. 209-170.000.
Trailer Train Company: *See—*
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., 4,190,390, Cl. 409-198.000.
Transworld Drilling Company: *See—*
Riggs, Olen L., Jr., 4,190,501, Cl. 204-1.00T.
Trapido, Leonard: *See—*
Perline, Irving W.; Trapido, Leonard; Rottenkolber, John J.; and Rottenkolber, Michael L., 4,189,822, Cl. 29-453.000.
Trautz, Volker: *See—*
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.
Traver, Frank J.; and Cietek, Timothy J., to General Electric Company. Silicone paper release compositions. 4,190,688, Cl. 427-391.000.
Treadaway, Michael F., to British Petroleum Company Limited, The. Polymer-optical brightener combinations in transparent film form useful as glazing materials capable of modifying plant growth rate. 4,189,866, Cl. 47-58.000.
Tregillus, Kenneth C.: *See—*
Atkinson, Gordon E.; and Tregillus, Kenneth C., 4,190,206, Cl. 239-271.000.
Triani, Ronald J.: *See—*
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.
Troxler, Richard J.: *See—*
Burckhardt, Urs; and Troxler, Richard J., 4,190,604, Cl. 260-592.000.
Trueb, Werner, to Sandoz Ltd. Di-(cyanoalkyl)-β-haloethanephosphonates and dithiophosphonates and use as plant growth regulators. 4,190,430, Cl. 71-86.000.
TRW Inc.: *See—*
Crouse, Ronald J., 4,190,767, Cl. 250-231.0SE.
DiBugnara, Raymond, 4,190,458, Cl. 106-287.160.
Tsang, Won-Tien: *See—*
Logan, Ralph A.; and Tsang, Won-Tien, 4,190,813, Cl. 331-94.50H.
Tsao, Utah, to Lummus Company, The. Recovery of hydrogen chloride in carbo-chlorination of metal oxides. 4,190,639, Cl. 423-491.000.
Tschek, Wolfgang: *See—*
Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, 4,189,995, Cl. 99-447.000.
Tsuboi, Shinichi: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,190,653, Cl. 424-224.000.
Tsugei, Shinji: *See—*
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, 4,190,329, Cl. 350-338.000.
Tucker, Archie J.: *See—*
Covington, Roger G.; Miller, Stephen H.; and Tucker, Archie J., 4,190,420, Cl. 422-63.000.
Tucker, Benjamin W.: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,190,599, Cl. 260-453.00P.
Tucker, Harold A., to B. F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. 4,190,582, Cl. 260-239.30R.
Turk, Gunter: *See—*
Achenbach, Karl; and Turk, Gunter, 4,190,632, Cl. 423-118.000.
Turner, Denver R. Smoker's pipe. 4,190,063, Cl. 131-195.000.
Turner, Roger C.: *See—*
Knight, J. Nelson; and Turner, Roger C., 4,190,305, Cl. 312-214.000.
Turpin, Charles H.; and Hoese, Thomas C., to Pillsbury Company, The. Microwave heating package and method. 4,190,757, Cl. 219-10.55E.
Tuson, Samuel, to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H. Equipment serving to connect oil-tankers to marine towers. 4,190,090, Cl. 141-387.000.
Tyler, Frederick B., Jr.: *See—*
McKibbin, John R.; and Tyler, Frederick B., Jr., 4,190,236, Cl. 266-69.000.
Tymchuck, Donald L.; Beall, Nelson J.; Davis, Noel; and Dreier, William M., to General Mills, Inc. Package for perishable produce. 4,189,868, Cl. 47-84.000.
Uddeholms Aktiebolag: *See—*
Johnsson, M. K. Olof; Lindstrom, Rune H.; Lundstrom, Per-Ake; and Norberg, Lars-Gunnar, 4,190,435, Cl. 75-12.000.
Ueda, Takeo, to NSK-Warner K. K. Safety belt take-up device. 4,190,213, Cl. 242-107.40A.
Uedaira, Satoru: *See—*
Aso, Koichi; Uedaira, Satoru; Ito, Shigeyasu; Tamura, Hidemasa; and Makino, Yoshimi, 4,190,438, Cl. 75-123.00B.
Ullman, Edwin F.: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,190,496, Cl. 435-7.000.
Ulrich, Henri: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,190,599, Cl. 260-453.00P.
Umezawa, Hamao: *See—*
Nakayama, Yuya; Kunishima, Mamoru; Matsuda, Akira; Takeuchi, Tomio; and Umezawa, Hamao, 4,190,589, Cl. 260-343.600.
Umezawa, Kazumi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,190,464, Cl. 134-6.000.
Union Carbide Corporation: *See—*
Decker, Quintin W.; and Marcus, Erich, 4,190,601, Cl. 260-583.00R.
Gortsema, Frank P., 4,190,439, Cl. 75-211.000.
Kaplan, Leonard, 4,190,598, Cl. 260-449.00L.
Schnitzler, Danny L., 4,190,257, Cl. 277-102.000.
Smith, Derek R., 4,190,479, Cl. 156-294.000.
Zdrahala, Richard J.; and Critchfield, Frank E., 4,190,711, Cl. 521-112.000.
Union Oil Company of California: *See—*
Ward, John W., 4,190,553, Cl. 252-412.000.
Unique Tool & Die Co.: *See—*
Bronkema, James W.; and Hoeksema, Norman L., 4,190,408, Cl. 425-145.000.
Uniroyal, Inc.: *See—*
Geck, Joseph C.; and Hamilton, Floyd E., 4,190,406, Cl. 425-38.000.
Unit Process Assemblies, Inc.: *See—*
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.
Unit Rig & Equipment Co.: *See—*
Beck, Earl, 4,190,130, Cl. 180-133.000.
United Kingdom Atomic Energy Authority: *See—*
Thomson, Alan R.; and Miles, Brynley J., 4,190,576, Cl. 260-122.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the: *See—*
Moody, George W.; and Meir, Robert A., 4,189,918, Cl. 60-398.000.
United States Gypsum Company: *See—*
Kuhr, Albert F., 4,189,893, Cl. 52-779.000.
United States of America
Air Force: *See—*
Albanese, Victor J., 4,190,815, Cl. 333-101.000.
Cross, Edward F.; and Garber, Wilbur A., 4,190,858, Cl. 358-113.000.
Fajen, Lyle A., 4,190,808, Cl. 331-59.000.
Schaffrin, Carl E., 4,190,273, Cl. 292-288.000.
Van Workum, John A., 4,190,814, Cl. 331-94.50C.
Army: *See—*
Cowett, Philip M., Jr., 4,190,883, Cl. 363-26.000.
Drzewiecki, Tadeusz M.; and Goto, John M., 4,190,083, Cl. 137-838.000.
Dunmire, Howard L.; and Horn, Stuart B., 4,190,106, Cl. 165-185.000.
Redman, Charles M., 4,190,769, Cl. 250-332.000.
Shaull, John M.; Gauld, Godfrey R.; and Richtmyer, Lawson E., 4,190,000, Cl. 102-19.200.
Energy: *See—*
Andersen, John A.; and Cole, James K., 4,190,160, Cl. 206-591.000.

Day, Robert A.; and Conti, Armond E., 4,189,944, Cl. 73-623.000.
Eberhart, James G.; and Battles, James E., 4,189,827, Cl. 29-623.100.
Hendricks, Charles D., 4,190,016, Cl. 118-724.000.
Kennedy, Charles R., 4,190,637, Cl. 423-448.000.
Ko, Suk M.; Grodzka, Philomena G.; and McCormick, Paul O., 4,189,848, Cl. 34-32.000.

National Aeronautics and Space Administration: *See—*
Greenleaf, John E.; and Delaplaine, Robert W., 4,190,060, Cl. 128-760.000.
Marek, Cecil J.; and Cooper, Larry P., 4,189,914, Cl. 60-726.000.
Weyler, George M., Jr., 4,190,626, Cl. 264-229.000.

Navy: *See—*
Anderson, Lloyd D., 4,189,999, Cl. 102-18.00R.
Follin, James W.; and Miller, Robert E., 4,190,818, Cl. 367-138.000.
Howe, David G.; and Gubser, Donald U., 4,190,701, Cl. 428-662.000.
Hughes, Richard S., 4,190,327, Cl. 350-310.000.
Miles, Melvin H.; Fletcher, Aaron N.; and Fine, Dwight A., 4,190,704, Cl. 429-103.000.
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.

U.S. Philips Corporation: *See—*
Buynak, William J., 4,190,835, Cl. 340-750.000.
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.
Klokkers, Frits H., 4,190,873, Cl. 361-56.000.
Lux, Peter, 4,190,861, Cl. 358-135.000.
Walraven, Anthonie, 4,190,871, Cl. 360-113.000.

United States Tobacco Company: *See—*
Boyd, Eugene J., 4,190,170, Cl. 215-307.000.

United Technologies Corporation: *See—*
Drs, Kenneth E.; Salafia, Sebastian J.; and Schulmeister, Lee F., 4,190,404, Cl. 425-8.000.
Giamei, Anthony F., 4,190,094, Cl. 164-60.000.
Preston, John L., Jr., 4,190,641, Cl. 423-653.000.

University of Michigan, The Regents of the: *See—*
Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., 4,190,669, Cl. 424-305.000.

University of Utah: *See—*
Jacobsen, Stephen C.; Stephen, Robert L.; Knutti, David F.; and Kablitz, Carl, 4,190,047, Cl. 128-213.00A.

UOP Inc.: *See—*
Antos, George J., 4,190,521, Cl. 208-139.000.
Antos, George J., 4,190,557, Cl. 252-441.000.
Gewartowski, Steve A., 4,190,520, Cl. 208-95.000.

Updike, Peter E. Security mounting. 4,190,221, Cl. 248-551.000.

Upjohn Company, The: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,190,599, Cl. 260-453.00P.

Upton, Robert W., Jr., to Honeywell Inc. Optical slip ring apparatus utilizing radial light signals. 4,190,318, Cl. 350-96.200.

Urashima, Chikayuki: *See—*
Nisida, Sinichi; Urashima, Chikayuki; and Masumoto, Hiroki, 4,189,975, Cl. 85-1.00T.

Urlberger, Hans. Fastening device for a safety fence beam. 4,190,376, Cl. 403-14.000.

Usami, Katuyuki: *See—*
Takamura, Yoshinori; Hamada, Hakusei; Kitamura, Kiyoyuki; Inada, Tetsuro; Kodama, Kunio; and Usami, Katuyuki, 4,190,555, Cl. 252-429.00B.

Ushio Denki Kabushikikaisha: *See—*
Kira, Takehiro, 4,190,786, Cl. 313-184.000.

USM Corporation: *See—*
Holloway, David J., 4,189,933, Cl. 72-391.000.
Mauer, Dieter, 4,189,978, Cl. 85-72.000.

Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
Usui, Masayoshi, 4,190,504, Cl. 204-35.00R.

Usui, Masayoshi, to Usui Kokusai Sangyo Kabushiki Kaisha. Anticorrosive overlap-coated steel material. 4,190,504, Cl. 204-35.00R.

Vanderford, Delbert E., to Cameron Iron Works, Inc. Tubing hanger for temperature variations and extremes. 4,190,270, Cl. 285-142.000.

van der Schoot, Jelle, to Staalkat B.V. Method and apparatus for drying a roller conveyor loaded with articles, such as eggs, and apparatus for washing, drying and candling eggs loaded on a roller conveyor. 4,189,849, Cl. 34-33.000.

Vanderspurt, Thomas H.; and Taylor, Paul D., to Celanese Corporation. Device for generating super atmospheric pressures of sensitive materials in a gas stream. 4,190,620, Cl. 261-148.000.

Van Heyningen, Woeldrik P., to Swift Canadian Co., Limited. Removing back fat from loin. 4,189,806, Cl. 17-52.000.

van Houwelingen, Gerrit D. B.: *See—*
Giezen, Egenius A.; van Houwelingen, Gerrit D. B.; and Cramer, Marietta, 4,189,942, Cl. 73-356.000.

Van Ryn, Arthur L.: *See—*
Crossman, Philip E.; and Van Ryn, Arthur L., 4,189,876, Cl. 52-9.000.

Vanstone, Anthony E.; and Maile, Graham K., to Biorex Laboratories Limited. Chalcone derivatives. 4,190,671, Cl. 424-317.000.

Van Voorhis, David C., to International Business Machines Corporation. Major/minor loop bubble memory with timing loop. 4,190,900, Cl. 365-15.000.

Van Workum, John A., to United States of America, Air Force. Single axis resonator for laser. 4,190,814, Cl. 331-94.50C.

Varcoe, Gordon G.: *See—*
Coffee, Harold R.; Varcoe, Gordon G.; Triani, Ronald J.; and Hayden, George S., 4,190,679, Cl. 426-623.000.

Varian Associates, Inc.: *See—*
Dinwiddie, Kendall L.; Friday, Robert G.; Racz, Janos A.; and Seppi, Edward J., 4,190,772, Cl. 250-445.00T.

Vasicek, Vladimir: *See—*
Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, 4,190,067, Cl. 139-435.000.

Veach, Carlos W. Push button controlled water system. 4,189,792, Cl. 4-192.000.

VEB Pentacon Dresden Kamera- und Kinowerke: *See—*
Schutze, Siegfried; and Locke, Werner, 4,190,337, Cl. 354-60.00L.

Veber, Daniel F., to Merck & Co., Inc. Peptides having somatostatin activity. 4,190,648, Cl. 424-177.000.

Veeder Industries Inc.: *See—*
Fleischer, Donald W., 4,190,765, Cl. 235-92.00C.

Vegezzi, Davide, to Enrico Corvi Mora. Method for the preparation of verbenone, myrtenal and pinocarveol and their therapeutical use. 4,190,675, Cl. 424-331.000.

Veigl, Johann: *See—*
Hochbaum, Istvan ; Ketzer, Mandred; Laa, Friedrich; and Veigl, Johann, 4,190,215, Cl. 242-186.000.

Velsicol Chemical Corporation: *See—*
Krenzer, John, 4,190,431, Cl. 71-92.000.

Vendo Company, The: *See—*
Moss, Charles A.; and Andrews, Boley A., 4,190,179, Cl. 221-299.000.

Verfahrenstechnik Dr. Ing. Kurt Baum: *See—*
Baum, Jorg P., 4,190,237, Cl. 266-80.000.

Vernay Laboratories, Inc.: *See—*
Atkinson, Gordon E.; and Tregillus, Kenneth C., 4,190,206, Cl. 239-271.000.

Vessey, Donald C. Foam mattress with floatation torso support. 4,189,798, Cl. 5-451.000.

Victor Company of Japan, Ltd.: *See—*
Kinjo, Hisao, 4,190,859, Cl. 358-128.500.
Ota, Yoshihiko, 4,190,869, Cl. 360-10.000.

Vidonne, Louis: *See—*
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,190,743, Cl. 179-18.0GF.

Viking Industries, Inc.: *See—*
Byerly, Robert M., 4,189,807, Cl. 24-16.00R.

Vimercati, Ettore. Bilaterally balanced fluid control valve. 4,190,231, Cl. 251-118.000.

Virag, Robert A., to Baxter Travenol Laboratories, Inc. Nebulizer cap system having heating means. 4,190,046, Cl. 128-200.210.

Volk, Karl G., to SemPrex Corporation. Drive system for mensuration stages or the like. 4,189,953, Cl. 74-479.000.

Volkert, John K.; and Volkert, Robert B., to Compak Systems, Inc. Method and apparatus for making envelope assemblies. 4,189,895, Cl. 53-429.000.

Volkert, Robert B.: *See—*
Volkert, John K.; and Volkert, Robert B., 4,189,895, Cl. 53-429.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Heitland, Herbert; Kroll, Rudolf; and Grundmann, Edgard, 4,190,038, Cl. 126-445.000.

Vondall, Ronald J.: *See—*
Oden, Jerome H.; Swanson, Roy E., Jr.; and Vondall, Ronald J., 4,190,107, Cl. 166-120.000.

Von Stosch, Rudiger Graf: *See—*
Pohl, Andreas P. I., 4,190,484, Cl. 156-580.000.

Voorhees, John J.; Hammarstrom, Sven R.; Hamberg, Mats A.; and Samuelsson, Bengt I., to University of Michigan, The Regents of the. Method for treating psoriasis. 4,190,669, Cl. 424-305.000.

Voros, Ferenc: *See—*
Tamas, Karoly; Voros, Ferenc; and Bedo, Ilona, 4,190,020, Cl. 119-14.080.

Vorwerk Interholding GmbH: *See—*
Eckart, Manfred, 4,190,307, Cl. 339-6.00R.

Voss, Eckart; Stadler, Peter; Petersen, Uwe; Kabbe, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 4,6-Di-O-(aminoglycosyl)-1,3-diaminocyclitols, process for their production and their use. 4,190,722, Cl. 536-17.00R.

Vsesojuzny Nauchno-Isslekovatelsky Institut Monokristallov Stsintillyatsionnykh Materialov I Osobo Chistykh Khimicheskikh Veschestv: *See—*
Apilat, Vitaly Y.; Litichevsky, Marx I.; Mjulendorf, Oleg S.; and Eidelman, Lev G., 4,190,630, Cl. 422-249.000.

Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See—*
Kuda, Vladimir; Vasicek, Vladimir; and Suchanek, Borivoj, 4,190,067, Cl. 139-435.000.

Vyzkumny ustav kozedelny: *See—*
Muck, Eduard; Hrabal, Zdenek; Ambroz, Ludvik; and Horak, Josef, 4,190,694, Cl. 428-212.000.

W. A. Brown & Son, Inc.: *See—*
Russell, Lillard G., 4,189,929, Cl. 62-175.000.

W. M. Cissell Manufacturing Company: *See—*
Elmy, Richard A., 4,190,414, Cl. 432-46.000.

W. R. Grace & Co.: *See—*
Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., 4,189,886, Cl. 52-302.000.

Waaben, Sigurd G.: *See—*
Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., 4,190,747, Cl. 179-170.0NC.
Wada, Yoji: *See—*
Suzuki, Naoyuki; Wada, Yoji; Furuno, Akihisa; and Ishii, Masao, 4,190,717, Cl. 526-62.000.
Wade, Thomas B.; and Knight, James A., to Aqua-Aerobic Systems, Inc. Waste water treatment apparatus. 4,190,541, Cl. 210-241.000.
Wagensonner, Eduard, to Agfa-Gevaert AG. Photographic camera with exposure control utilizing a phase controllable crystal. 4,190,343, Cl. 354-227.000.
Wahl, Heinz. Timing chain tensioners. 4,190,025, Cl. 123-90.310.
Wakazono, Kenji: *See—*
Ishiguro, Yasuo; and Wakazono, Kenji, 4,190,344, Cl. 354-234.000.
Walker, Gordon M.: *See—*
Lynn, William F.; and Walker, Gordon M., 4,190,302, Cl. 308-36.100.
Wallace, Charles H., to International Telephone and Telegraph Corporation. Internal heat exchanger for meat. 4,190,100, Cl. 165-48.00R.
Wallace, Eric G.: *See—*
Monthony, James F.; Delony, Timothy E.; Wallace, Eric G.; and Schick, Walter H., 4,190,517, Cl. 204-299.00R.
Walline, Robert E., to M/A COM, Inc. Production of epitaxial layers by vapor deposition utilizing dynamically adjusted flow rates and gas phase concentrations. 4,190,470, Cl. 148-175.000.
Walraven, Anthonie, to U.S. Philips Corporation. Magnetic converter having a magnetoresistive element. 4,190,871, Cl. 360-113.000.
Walters, Robert A.; and Hirtz, Russell E., to ARCO Medical Products Company. Circuit for determining the parameter control states of an implanted pacer. 4,190,055, Cl. 128-419.0PT.
Walton, Richard E., II: *See—*
Sauerwein, William D.; and Walton, Richard E., II, 4,190,781, Cl. 310-239.000.
Ward, John W., to Union Oil Company of California. Rejuvenation of damaged zeolite-supported metal catalysts. 4,190,553, Cl. 252-412.000.
Wardlaw, Stephen C.: *See—*
Levine, Robert A.; Massey, James V., III; and Wardlaw, Stephen C., 4,190,328, Cl. 350-320.000.
Warmbier, Henry: *See—*
Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, 4,190,477, Cl. 156-244.110.
Warnant, Julien; Farcilli, Andre; and Medici, Italo, to Roussel Uclaf. 14-Imino-(15H)-eburnamine compounds, compositions, methods of use and process of synthesis. 4,190,658, Cl. 424-256.000.
Warner, Raymond M., Jr. Photovoltaic semiconductor device and method of making same. 4,190,852, Cl. 357-30.000.
Warnet, Henri; and Fouinat, Paul, to Societe Anonyme Dite: Ceraver. Electrical insulator and method of making same. 4,190,736, Cl. 174-209.000.
Washizuka, Isamu; Aoki, Junji; and Tomino, Tadashi, to Sharp Kabushiki Kaisha. Combination calculator and timepiece. 4,189,912, Cl. 58-152.00R.
Washizuka, Isamu; Teramura, Satoshi; Tsugei, Shinji; and Hirayama, Kazuyoshi, to Sharp Kabushiki Kaisha. Liquid crystal display cell of the reflection type. 4,190,329, Cl. 350-338.000.
Wassell, Ronald H.: *See—*
Wyatt, Brian S.; and Wassell, Ronald H., 4,190,512, Cl. 204-196.000.
Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., to Research Corporation. Synthesis of beta-lactams from azetidine carboxylic acid esters. 4,190,579, Cl. 260-239.00A.
Watanabe, Kouichi: *See—*
Shimada, Akira; Watanabe, Kouichi; and Nakajima, Katsuji, 4,190,137, Cl. 191-27.000.
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, to Taisho Pharmaceutical Co., Ltd. Novel penicillin derivatives. 4,190,581, Cl. 260-239.100.
Watkins, Richard K.: *See—*
Oliff, James R.; and Watkins, Richard K., 4,190,149, Cl. 206-145.000.
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., to Wilkinson Sword Limited. Compositions having a physiological cooling effect. 4,190,643, Cl. 424-54.000.
Watson, James H. P., to English Clays Lovering Pochin & Co., Ltd. Magnetic separators. 4,190,524, Cl. 209-213.000.
Webb, Harry A.: *See—*
Lawrence, Jackson; and Webb, Harry A., 4,189,847, Cl. 34-19.000.
Webber, David A.: *See—*
Armond, John W.; Webber, David A.; and Smith, Kenneth C., 4,190,424, Cl. 55-58.000.
Webber, Jack C. Swab. 4,190,108, Cl. 166-202.000.
Weber, Donald R., to Rapicom, Inc. Data transmission system using a sequential approximation encoding and decoding technique. 4,190,824, Cl. 340-347.0AD.
Weber, Heinz: *See—*
Mahnke, Harald; Nieberle, Juergen; Trautz, Volker; and Weber, Heinz, 4,190,547, Cl. 252-62.000.
Weber, Robert J., to Rockwell International Corporation. Sampled error phaselock or frequencylock systems. 4,190,807, Cl. 331-1.00A.
Webster, Bruce L.: *See—*
Rispin, Peter P.; Webster, Bruce L.; Stasiewicz, John; and Diggs, Jesse S., 4,190,012, Cl. 114-243.000.
Webster, David F. Means for recording patient care. 4,190,268, Cl. 282-3.00R.
Weed Eater, Inc.: *See—*
Kwater, James L., 4,189,833, Cl. 30-276.000.
Weimar, Erich: *See—*
Soecknick, Erhard; and Weimar, Erich, 4,190,473, Cl. 156-80.000.
Weinstock, Jacques: *See—*
Saunders, James; Hay, William D.; Weinstock, Jacques; and Lieber, Derek, 4,190,770, Cl. 250-308.000.
Weiss, Martin J.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,596, Cl. 260-448.20D.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-mei L., 4,190,597, Cl. 260-448.20D.
Wells, Richard E.; and Kinda, Frank L. Adjustable wire divider. 4,190,167, Cl. 211-184.000.
Welsh, Barry L.: *See—*
Pyne, Clive R.; and Welsh, Barry L., 4,190,804, Cl. 328-3.000.
Welte, Rainer; Markusch, Peter; Dieterich, Dieter; and Dietrich, Werner, to Bayer Aktiengesellschaft. Process for the production of mineral fiber mats. 4,190,459, Cl. 106-287.250.
Wenzel, Joerg; and Mai, Erich, to Haamann, Josef. Gear rack hoist. 4,190,135, Cl. 187-1.00R.
Wermuth, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for the selective compression or expansion of the dynamic range of a signal. 4,190,806, Cl. 330-51.000.
Wern, Lars A.: *See—*
Bejting, Anders M. T.; and Wern, Lars A., 4,190,833, Cl. 340-707.000.
Werne, Stig. Device for draft control. 4,190,197, Cl. 236-1.00G.
Weschenfelder, Otto T.: *See—*
Michalik, Horst B.; and Weschenfelder, Otto T., 4,190,243, Cl. 270-66.000.
Wesgar Industries Ltd.: *See—*
Purdy, John W., 4,190,269, Cl. 285-38.000.
West Electric Company, Ltd.: *See—*
Esaki, Koreaki, 4,190,880, Cl. 362-18.000.
West, Harrison; and Delaney, Bobby R., to General Electric Company. Compact multimission aircraft propulsion simulator. 4,189,939, Cl. 73-116.000.
West & Son (Engineers) Limited: *See—*
Brown, John E., 4,190,299, Cl. 308-3.500.
Westerman, Ira J., to B. F. Goodrich Company, The. Improved water absorbent copolymers of copolymerizable carboxylic acids and acrylic or methacrylic esters. 4,190,562, Cl. 260-17.4UC.
Western Company of North America, The: *See—*
Beirute, Robert M., 4,190,110, Cl. 166-291.000.
Western Electric Company, Incorporated: *See—*
Dewees, Thomas J.; Fangman, John S.; and Lin, Wen, 4,190,631, Cl. 422-249.000.
Lien, Suei-Yuen P., 4,190,467, Cl. 148-1.500.
Sonntag, Paul A., 4,189,831, Cl. 30-232.000.
Westinghouse Electric Corp.: *See—*
Bains, Gurdip S.; and Martin, Niles J., 4,189,890, Cl. 52-584.000.
Gainer, Robert E., 4,190,753, Cl. 200-144.00B.
Galloway, Dudley L.; and Donoghue, Robert E., 4,190,732, Cl. 174-17.0LF.
Gray, Lewis, 4,189,927, Cl. 60-687.000.
Hsu, James J., 4,189,926, Cl. 60-687.000.
Knight, Jerry W.; and Woodward, Mervyn, 4,190,389, Cl. 409-120.000.
LaCoste, Bernard L., 4,189,924, Cl. 60-641.000.
Pebler, Alfred R., 4,190,499, Cl. 204-1.00T.
Wootton, Roy E., 4,190,733, Cl. 174-28.000.
Weston, George O., to John Wyeth & Brother Limited. Process for preparing oxazoles. 4,190,584, Cl. 548-236.000.
Westvaco Corporation: *See—*
Forbes, Hampton E., Jr., 4,190,191, Cl. 229-43.000.
Gendron, Wilfred H., 4,190,161, Cl. 206-620.000.
Russell, Frederick S., 4,190,151, Cl. 206-281.000.
Weyerhaeuser Company: *See—*
Brookhyser, Byron B., 4,189,851, Cl. 34-236.000.
Weyler, George M., Jr., to United States of America, National Aeronautics and Space Administration. Method of manufacture of bonded fiber flywheel. 4,190,626, Cl. 264-229.000.
Weyrich, Erwin: *See—*
Hofmann, Eberhard; and Weyrich, Erwin, 4,190,401, Cl. 417-313.000.
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., to Research Corporation. High surface area permeable material. 4,190,079, Cl. 137-561.00R.
White, Rodney A.: *See—*
White, Eugene W.; Hanusiak, William M.; and White, Rodney A., 4,190,079, Cl. 137-561.00R.
Whiteley, Eric, to Canadian General Electric Company Limited. Liquid cooled disc machines. 4,190,780, Cl. 310-59.000.
Whiting, Sheldon G. Seismic responsive operating device. 4,189,945, Cl. 73-652.000.
Wiedman, Francis W., III: *See—*
Bhattacharyya, Arup; and Wiedman, Francis W., III, 4,190,466, Cl. 148-1.500.
Wiel, Gaston: *See—*
Merat, Jean-Pierre; and Wiel, Gaston, 4,189,899, Cl. 53-570.000.
Wielesiuk, Aleksander: *See—*
Barwell, John H.; and Wielesiuk, Aleksander, 4,190,684, Cl. 427-194.000.
Wildenberg, Thomas S.: *See—*
Ossian, William F.; Wildenberg, Thomas S.; and Warmbier, Henry, 4,190,477, Cl. 156-244.110.

Wilkinson Sword Limited: *See*—
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,190,643, Cl. 424-54.000.
Williams, Albert L.: *See*—
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,190,588, Cl. 260-343.600.
Williams, Earl P.: *See*—
Lorenz, Donald H.; Williams, Earl P.; and Schultz, Herman S., 4,190,718, Cl. 526-207.000.
Williamson, Clifton L.; Hocker, Harvey L.; and Alcamo, John M., to Northwest Sanitation Products, Inc. Automatic liquid dispenser for an inverted bottle. 4,189,793, Cl. 4-228.000.
Wilson, Charles A.: *See*—
Burk, George A.; and Wilson, Charles A., 4,190,668, Cl. 424-304.000.
Wingard, Robert E., Jr.: *See*—
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,190,716, Cl. 525-334.000.
Winslow, John S.: *See*—
Somers, Frank J.; and Winslow, John S., 4,190,860, Cl. 358-128.500.
Winter, Karl, to CEAG Ceagfilter und Entstaubungstechnik GmbH. Method of operating an adsorption filter. 4,190,423, Cl. 55-20.000.
Winterhoff, Gunter: *See*—
Lohr, Alfred; Winterhoff, Gunter; and Tschek, Wolfgang, 4,189,995, Cl. 99-447.000.
Winters, Harold F., to International Business Machines Corporation. Etching method using noble gas halides. 4,190,488, Cl. 156-643.000.
Winterscheid, Josef: *See*—
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.
Wipke, Walter J.: *See*—
Cooper, Leon M.; and Wipke, Walter J., 4,190,845, Cl. 346-75.000.
Witco Chemical Corporation: *See*—
Kaufman, John J.; and Luisi, Thomas E., 4,190,570, Cl. 260-33.6PQ.
Wittmann, Heinz: *See*—
Himmetsberger, Alois; and Wittmann, Heinz, 4,190,264, Cl. 280-618.000.
Wolf, Daniel E.: *See*—
Crane, Hewitt D.; and Wolf, Daniel E., 4,190,820, Cl. 340-146.3SG.
Wolf, Daniel H. Movement sensitive anti-theft alarm. 4,190,828, Cl. 340-571.000.
Wolf, David L.: *See*—
deBuhr, Harold E.; Bass, Merlyn D.; Krafka, Jerry L.; Wolf, David L.; and Christopher, Kenneth R., 4,190,209, Cl. 241-101.700.
Wolf, Isaac M. Brazing inserts. 4,190,127, Cl. 175-410.000.
Wolfes, Wolfgang: *See*—
Bison, Gunter; Elfgen, Reiner; Heinzelmann, Walter; Winterscheid, Josef; and Wolfes, Wolfgang, 4,190,592, Cl. 260-349.000.
Wolverine Aluminum Corporation: *See*—
Fritz, Jack E., 4,189,885, Cl. 52-287.000.
Wombold, Harry A. E.: *See*—
Allen, David O.; and Wombold, Harry A. E., 4,190,175, Cl. 220-270.000.
Wonisch, Franz, to Mayer & Wonisch Spezialfabrik fuer Mess- und Regelgeraete. Apparatus for starting and fanning a fire. 4,190,034, Cl. 126-25.00B.
Wood, Eugene W. Telescoping intermedullary pin. 4,190,044, Cl. 128-92.0BC.
Woodward, Mervyn: *See*—
Knight, Jerry W.; and Woodward, Mervyn, 4,190,389, Cl. 409-120.000.
Woodward, Thomas R., to Burroughs Corporation. Self-healing loop communications system. 4,190,821, Cl. 340-147.0SC.
Wootton, Roy E., to Westinghouse Electric Corp. High-voltage electrical apparatus utilizing an insulating gas of sulfur hexafluoride and helium. 4,190,733, Cl. 174-28.000.
Worboys, John C.: *See*—
Absolon, Victor J.; Hurst, George T.; Worboys, John C.; Barnett, George H.; and Dickson, Ross P., 4,190,456, Cl. 106-99.000.
Woron, Robert P., to Allen Organ Company. Method and apparatus for achieving timbre modulation in an electronic musical instrument. 4,189,970, Cl. 84-1.190.
Wortley, Stewart W. Magnifying means. 4,190,322, Cl. 350-181.000.
Wright, Albert T. Flow homogenizer. 4,190,032, Cl. 123-141.000.
Wright, John L.: *See*—
Frohlich, Robert T.; Wright, John L.; and Blessington, Bruce A., 4,189,886, Cl. 52-302.000.
Wright, John V.: *See*—
Johnson, Michael K.; Johnson, Clarence E.; Parker, Raymond E.; and Wright, John V., 4,189,891, Cl. 52-742.000.
Wu, James S.: *See*—
Wasserman, Harry H.; Lipshutz, Bruce H.; and Wu, James S., 4,190,579, Cl. 260-239.00A.
Wunderer, Armin: *See*—
Hesky, Hans; and Wunderer, Armin, 4,190,507, Cl. 204-129.000.
Wunderlich, Klaus: *See*—
Schutze, Detlef-Ingo; and Wunderlich, Klaus, 4,190,726, Cl. 546-27.000.
Wyatt, Brian S.; and Wassell, Ronald H., to I.S.C. Alloys Limited. Sacrificial anodes. 4,190,512, Cl. 204-196.000.
Wyatt, Everette L., to Armco Steel Corporation. Waste water filtration and sludge removal system. 4,190,534, Cl. 210-80.000.
Wyatt, Lesley J.: *See*—
Hunter, Donald N.; and Wyatt, Lesley J., 4,190,453, Cl. 106-85.000.
Xerox Corporation: *See*—
Avery, Stephen T.; Durbin, John A.; Lama, William L.; and Stiebitz, Paul H., 4,190,355, Cl. 355-71.000.
Friday, Bruce W., 4,190,348, Cl. 355-3.0TR.
Guenther, Joachim, 4,190,247, Cl. 271-291.000.
Smith, Craig A.; and Guenther, Joachim, 4,190,354, Cl. 355-3.0SH.
Yabe, Toshinori, to Bridgestone Tire Company Limited. Tire building apparatus. 4,190,482, Cl. 156-403.000.
Yaker, Charles: *See*—
Robb, Ronald R.; Yaker, Charles; and Burd, Lamar, 4,190,450, Cl. 106-38.900.
Yamada, Shigeru; and Ichikawa, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of numerical value processing type. 4,189,972, Cl. 84-1.250.
Yamada, Takashi: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,190,892, Cl. 364-711.000.
Yamagisi, Hirosi; Sakamaki, Shozo; Nakagawa, Koji; and Sirasawa, Minoru, to Denki Kagaku Kogyo Kabushiki Kaisha. Cement retarder and rapid hardening cement containing the same. 4,190,454, Cl. 106-90.000.
Yamaguchi, Hisashi: *See*—
Kawada, Toyoshi; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,190,789, Cl. 315-169.400.
Yamamori, Teruo: *See*—
Adachi, Ikuo; Yamamori, Teruo; and Hiramatsu, Yoshiharu, 4,190,728, Cl. 560-168.000.
Yamamoto, Yoichi; and Shimazawa, Yoichi, to Sharp Kabushiki Kaisha. Ink liquid concentration control in an ink liquid supply system for an ink jet system printer. 4,190,846, Cl. 346-140.00R.
Yamanaka, Akira: *See*—
Hirano, Tomoyuki; Yamanaka, Akira; and Tonai, Koichi, 4,190,276, Cl. 293-133.000.
Yamashita, Toshio; and Kaburagi, Hisashi. Speed reduction means. 4,189,961, Cl. 74-798.000.
Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, to Osaka Gas Company, Ltd. Method for reactivation of platinum group metal catalyst with aqueous alkaline and/or reducing solutions. 4,190,554, Cl. 252-412.000.
Yamazaki, Katsuo: *See*—
Sawada, Kiyoshi; and Yamazaki, Katsuo, 4,189,959, Cl. 74-720.000.
Yanagawa, Nobuyuki: *See*—
Ohno, Yukihiro; and Yanagawa, Nobuyuki, 4,190,349, Cl. 355-8.000.
Yanagimoto, Samon: *See*—
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, 4,190,887, Cl. 364-472.000.
Yanoh, Tomoo. Shaped metallic roofing plate. 4,189,889, Cl. 52-530.000.
Yasuhira, Tetsutaro: *See*—
Sakurai, Kenjiro; Shimada, Junichi; Morikawa, Takitaro; Mitsuhashi, Yoshinobu; Ishihara, Satoshi; Seko, Atsuya; and Yasuhira, Tetsutaro, 4,190,775, Cl. 250-570.000.
Yates, Donald. Hand gun case. 4,190,183, Cl. 224-238.000.
Yeates, Richard P.; Terlecky, Boris S.; and Shah, Jagdish K., to Trailer Train Company. Apparatus for machining critical surfaces of railroad truck side frames. 4,190,390, Cl. 409-198.000.
Yee, Kim S., to Sulzer Brothers Limited. Coated structural component for a high temperature nuclear reactor. 4,190,493, Cl. 176-60.000.
Yie, Gene G., to Institute of Gas Technology. High pressure pulsed water jet. 4,190,202, Cl. 239-101.000.
Ylagan, Carlos J.: *See*—
Appleton, Arthur I.; Liljequist, Jon L.; and Ylagan, Carlos J., 4,190,222, Cl. 248-56.000.
Yokoo, Chihiro: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Asaka, Toshifumi; and Sawada, Jiro, 4,190,581, Cl. 260-239.100.
Yokota, Hideo: *See*—
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York Manufacturing, Inc.: *See*—
Jentoft, Arthur P.; Anghinetti, Joseph P.; and Couture, Paul A., 4,189,877, Cl. 52-58.000.
Yoshida, Mitsuo: *See*—
Ogawa, Shinsaku; Yoshida, Mitsuo; and Shiroki, Hiroyuki, 4,190,505, Cl. 204-98.000.
Yoshida, Naoki: *See*—
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, 4,190,506, Cl. 204-98.000.
Yoshikawa, Kazuo; and Andoh, Shizuo, to Fujitsu Limited. Gas discharge panel. 4,190,788, Cl. 315-169.400.
Yoshioka, Kengo: *See*—
Sano, Yoshikazu; Haga, Kyosuke; and Yoshioka, Kengo, 4,189,963, Cl. 74-821.000.
Yoshitake, Katsumi: *See*—
Doi, Yoshinao; Kohno, Mitsuo; and Yoshitake, Katsumi, 4,190,707, Cl. 429-254.000.
Yoshitugu, Takashi: *See*—
Kawasaki, Nobuhiro; Yoshida, Naoki; and Yoshitugu, Takashi, 4,190,506, Cl. 204-98.000.
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, to Nippon Steel Corporation. Press roll piercing method. 4,190,887, Cl. 364-472.000.
Young, Danny J., to Fair, James W. Sun tracking system. 4,190,766, Cl. 250-203.00R.

Young, Prussin, Mgk, J. V.: *See*—
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,190,680, Cl. 427-4.000.

Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., to Young, Prussin, Mgk, J. V. Adherent controlled release pesticides. 4,190,680, Cl. 427-4.000.

Young, Rodney C.: *See*—
Durant, Graham J.; Young, Rodney C.; and Tashma, Zeav, 4,190,654, Cl. 424-270.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Fassbender, Rolf; and Lang, Armin, 4,189,983, Cl. 91-400.000.
Lang, Armin; and Fassbender, Rolf, 4,189,982, Cl. 91-400.000.

Zajichek, William J., to Allis-Chalmers Corporation. Vehicle transmission shifting mechanism. 4,189,952, Cl. 74-477.000.

Zani, David A. Solar energy liquid heating device. 4,190,039, Cl. 126-450.000.

Zaromb, Solomon. Fluidized-bed electrodes and related apparatus and methods. 4,190,703, Cl. 429-15.000.

Zdrahala, Richard J.; and Critchfield, Frank E., to Union Carbide Corporation. Thermoplastic polyether polyurethane elastomers. 4,190,711, Cl. 521-112.000.

Zenith Radio Corporation: *See*—
Citta, Richard W., 4,190,862, Cl. 358-195.000.

Zetterlund, Ture R.: *See*—
Amberg, Arthur A.; and Zetterlund, Ture R., 4,189,987, Cl. 98-2.140.

Zhitetsky, Leonid S.: *See*—
Skurikhin, Vladimir I.; Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,190,888, Cl. 364-497.000.

Zilinski, Erwin: *See*—
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,190,623, Cl. 264-22.000.

Zine, Anthony R., Jr.: *See*—
Luderer, Albert A.; Odstrchel, Gerald; and Zine, Anthony R., Jr., 4,190,535, Cl. 210-83.000.

Zinkin, Arthur S.: *See*—
Chevalier, Arthur C.; Zinkin, Arthur S.; Rosen, Robert; and McGarrity, Richard P., 4,190,882, Cl. 363-26.000.

Zitting, Gordon T., to Microdot Mfg., Inc. Single apex two element fluid pressure seal assembly. 4,190,259, Cl. 277-165.000.

Zucker, Friedrich J.; and Langenbusch, Hans J., to Supraton F. J. Zucker KG. Method and apparatus for mixing pulverulent drying substances and/or fluent media with one or more liquids. 4,190,373, Cl. 366-160.000.

Zuppichin, Sebastian: *See*—
Colognori, Aldo, 4,190,091, Cl. 145-52.000.

zur Hausen, Manfred: *See*—
Nehring, Rudolph; zur Hausen, Manfred; and Neumann, Werner, 4,190,731, Cl. 568-914.000.

Zwisler, Oswald; Guthohrlein, Gerhard; Nau, Hans-Heinrich; and Rinno, Helmut, to Behringwerke Aktiengesellschaft. Process for the isolation of the polyvalent proteinase inhibitor. 4,190,573, Cl. 260-112.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Moreno, Isabel L., to Ruiz, Edward F. Dough sheet spreader. Re. 30,221, Cl. 425-190.000.

Moreno, Isabel L.: *See*—
Ruiz, Edward F.; and Moreno, Isabel L., Re. 30,222, Cl. 425-190.000.

Ruiz, Edward F.; and Moreno, Isabel L., to Ruiz, Edward F. Dough sheet spreader. Re. 30,222, Cl. 425-190.000.

Ruiz, Edward F.: *See*—
Moreno, Isabel L., Re. 30,221, Cl. 425-190.000.

LIST OF PLANT PATENTEES

Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,505, Cl. 76.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,506, Cl. 78.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,505, 2-26-80, Cl. 76.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,506, 2-26-80, Cl. 78.000.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,505, Cl. 76.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,506, Cl. 78.000.

LIST OF DESIGN PATENTEES

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Ink cartridge with rupturable sealing element. 254,316, 2-26-80, Cl. D19-54.000.

Appleman, Donald T., to Procter & Gamble Company, The. Paper tissue. 254,333, 2-26-80, Cl. D59-2.00B.

Aprahamian, Vaughn, to Le-Bo Products Company, Inc. Storage receptacle for tape cartridges and cassettes. 254,282, 2-26-80, Cl. D6-188.000.

Arfert, Horst F. W.: *See*—
Reynolds, William G.; and Arfert, Horst F. W., 254,294, Cl. D9-216.000.
Reynolds, William G.; and Arfert, Horst F. W., 254,295, Cl. D9-220.000.

Bartasevich, William E., Jr.: *See*—
Sidor, William E.; Blanchard, Russell O.; and Bartasevich, William E., Jr., 254,321, Cl. D23-18.000.

Beall, Lester, Jr., to Trend Line Furniture Corporation. Seat. 254,280, 2-26-80, Cl. D6-62.000.

Behrmann, Helga I. Sweater. 254,276, 2-26-80, Cl. D2-44.000.

Benty, John L., to Sunbeam Corporation. Hair dryer. 254,328, 2-26-80, Cl. D28-13.000.

Blanchard, Russell O.: *See*—
Sidor, William E.; Blanchard, Russell O.; and Bartasevich, William E., Jr., 254,321, Cl. D23-18.000.

Buddy L Corporation: *See*—
Herstein, Barry S., 254,320, Cl. D21-134.000.

Carre, Alain, to Waterman S.A. Pen. 254,315, 2-26-80, Cl. D19-51.000.

Carter, William H. Garden plow with seed and fertilizer distributor. 254,306, 2-26-80, Cl. D15-12.000.

Chicone, Carmen P. Desk caddy. 254,317, 2-26-80, Cl. D19-75.000.

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